

**LAKE MEAD NATIONAL RECREATION AREA  
GRAND CANYON-PARASHANT NATIONAL MONUMENT**

**ENVIRONMENTAL ASSESSMENT FOR AERIAL  
OPERATIONS PLAN WITHIN  
LAKE MEAD NATIONAL RECREATION AREA AND  
GRAND CANYON-PARASHANT NATIONAL  
MONUMENT**

**Lake Mead National Recreation Area  
Grand Canyon-Parashant National Monument  
Clark County, Nevada  
Mohave County, Arizona**

**April 2005**

**US Department of the Interior, National Park Service**



---

## TABLE OF CONTENTS

---

SECTION I: PURPOSE OF AND NEED FOR ACTION .....	1
Introduction.....	1
Purpose and Need .....	1
Project Location .....	2
Related Laws, Policies, and Other Planning Documents.....	5
Environmental Assessment.....	10
Issues and Impact Topics .....	10
Issues and Impact Topics Identified for Further Analysis .....	10
Impact Topics Considered but Dismissed from Further Consideration.....	11
SECTION II: DESCRIPTION OF ALTERNATIVES.....	13
Introduction.....	13
Alternative A - No Action.....	13
Alternative B - Conduct Administrative Helicopter and Fixed-Wing Flights.....	14
Mitigation and Monitoring.....	19
Alternatives Considered But Eliminated From Further Evaluation.....	20
Consultation, Coordination, and Permit Requirements .....	20
Environmentally Preferred Alternative.....	20
Comparison of Impacts .....	22
SECTION III: AFFECTED ENVIRONMENT .....	23
Introduction.....	23
Location and General Description of Lake Mead NRA and the Lake Mead NRA Portion of Grand Canyon-Parashant NM.....	23
Natural Resources .....	23
Cultural Resources .....	26
Socioeconomic Resources, Visitor Use, and Park Operations .....	27
Wilderness Units .....	28
SECTION IV: ENVIRONMENTAL CONSEQUENCES .....	36
Introduction.....	36
Methodology .....	36
Criteria and Thresholds for Impact Analyses .....	36
Wildlife, Wildlife Habitat, and Sensitive Species .....	36
Natural Soundscapes .....	37
Criteria and Thresholds for Impact Analyses of All Other Issues .....	41
Impairment Analysis.....	42
Cumulative Effects.....	42
ALTERNATIVE A - No Action.....	49
Wildlife, Wildlife Habitat, Sensitive Species .....	49
Natural Soundscapes .....	50
Visual Resources.....	52

Visitor Experience .....	53
Safety .....	54
Wilderness.....	55
ALTERNATIVE B - Preferred Alternative .....	56
Wildlife, Wildlife Habitat, Sensitive Species .....	56
Natural Soundscapes.....	58
Visual Resources.....	60
Visitor Experience .....	60
Safety .....	61
Wilderness.....	62
SECTION V: COORDINATION AND CONSULTATION .....	65
SECTION VI: LIST OF PREPARERS .....	66
SECTION VII: REFERENCES.....	67

---

## LIST OF FIGURES

---

Figure 1. Regional Map .....	3
Figure 2. Area Map.....	4
Figure 3. Designated Wilderness Areas, Nevada.....	7
Figure 4. Wilderness Areas, Desert Region.....	29
Figure 5. Wilderness Areas, Shivwits Region .....	30
Figure 6. Commercial Air Tour, Existing Routes.....	44
Figure 7. Lake Zoning.....	45
Figure 8. Regional Airports and Airstrips.....	46
Figure 9. Area Roads .....	48

---

## LIST OF TABLES

---

Table 1. Potential Long-Term Impacts .....	22
--	----

---

## APPENDICES

---

Appendix A. Lake Mead NRA Interim Wilderness Guidelines And Minimum Requirements Analysis .....	71
Appendix B. National Park Service Scoping Press Release .....	85

---

## **SECTION I: PURPOSE OF AND NEED FOR ACTION**

---

### **Introduction**

The National Park Service (NPS) at Lake Mead National Recreation Area (NRA) and Grand Canyon-Parashant National Monument (NM), often referred to as the Shivwits Plateau, and its cooperating agencies, including the Nevada Department of Wildlife (NDOW), Arizona Game and Fish Department (AGFD), the Bureau of Reclamation (BOR), and the Bureau of Land Management (BLM), propose to utilize fixed-wing and helicopter flights for a variety of essential functions. These functions include law-enforcement patrols, wildlife monitoring and capture operations, delivery of supplies and equipment to project sites, and maintenance on radio towers in the backcountry and on adjacent lands. Some of these operations would occur over or within designated, suitable, or potential wilderness areas within the recreation area. Therefore, this environmental assessment with a wilderness minimum requirement analysis has been prepared to determine what is appropriate in wilderness, and to evaluate the effects of aerial operations over and within wilderness areas. A similar document was prepared by the NPS to cover activities occurring in 2004. This environmental assessment will serve as the interim management document until a wilderness management plan for Lake Mead NRA is completed.

### **Purpose And Need**

The NPS, either alone or in partnership with cooperating agencies, conducts aerial operations for several essential management activities within Lake Mead NRA and the Lake Mead NRA portion of the Grand Canyon-Parashant NM. These operations often occur within designated, suitable, and potential wilderness areas within both parks. Prior to 2004, the evaluation of flights in wilderness was conducted on a case-by-case basis. However, due to the potential for cumulative effects, and to allow for more comprehensive project planning and public notification, this environmental assessment will address the overall plan for potential aerial operations beginning in 2005 through such time as a wilderness management plan can be completed.

Aerial operations are proposed as a necessary component of the following types of activities:

1. Patrols, including wilderness monitoring
2. Repair and maintenance of existing radio towers
3. Wildlife surveys, monitoring, and management activities
4. Natural resource management projects related to habitat restoration and visitor protection

The underlying purpose of these projects is to provide for visitor and employee safety and health, to manage wildlife populations, and to monitor, rehabilitate and preserve wilderness resources within the context of the laws, regulations, and policies governing park management (see “Related Laws, Policies and Other Planning Documents,” below). The proposed helicopter and fixed-wing flights would allow park staff and cooperators to

accomplish these projects in a safe, timely, and efficient manner. The need for such projects is indicated in the Lake Mead NRA General Management Plan, Resource Management Plan, and Strategic Plan.

This environmental assessment will not evaluate the use of aerial operations related to emergency services such as fire and search and rescue. A fire management plan has been prepared for the recreation area that will take into account the wilderness minimum requirements for fire management activities. Search and rescue involving the health and safety of persons in wilderness areas are evaluated on a case-by-case basis and are conducted in accordance with all applicable regulations, policies, and guidelines for emergency responses, including the minimum requirement protocols as practicable.

The environmental assessment evaluates the no action alternative and one action alternative. The alternatives analyzed are: Alternative A: No action; and, Alternative B: Conduct Administrative Helicopter and Fixed-Wing Flights. This document also includes discussions of alternatives that have been ruled out and justifications for their elimination. The document serves as the minimum requirement analysis for activities proposed in wilderness areas (see Appendix A).

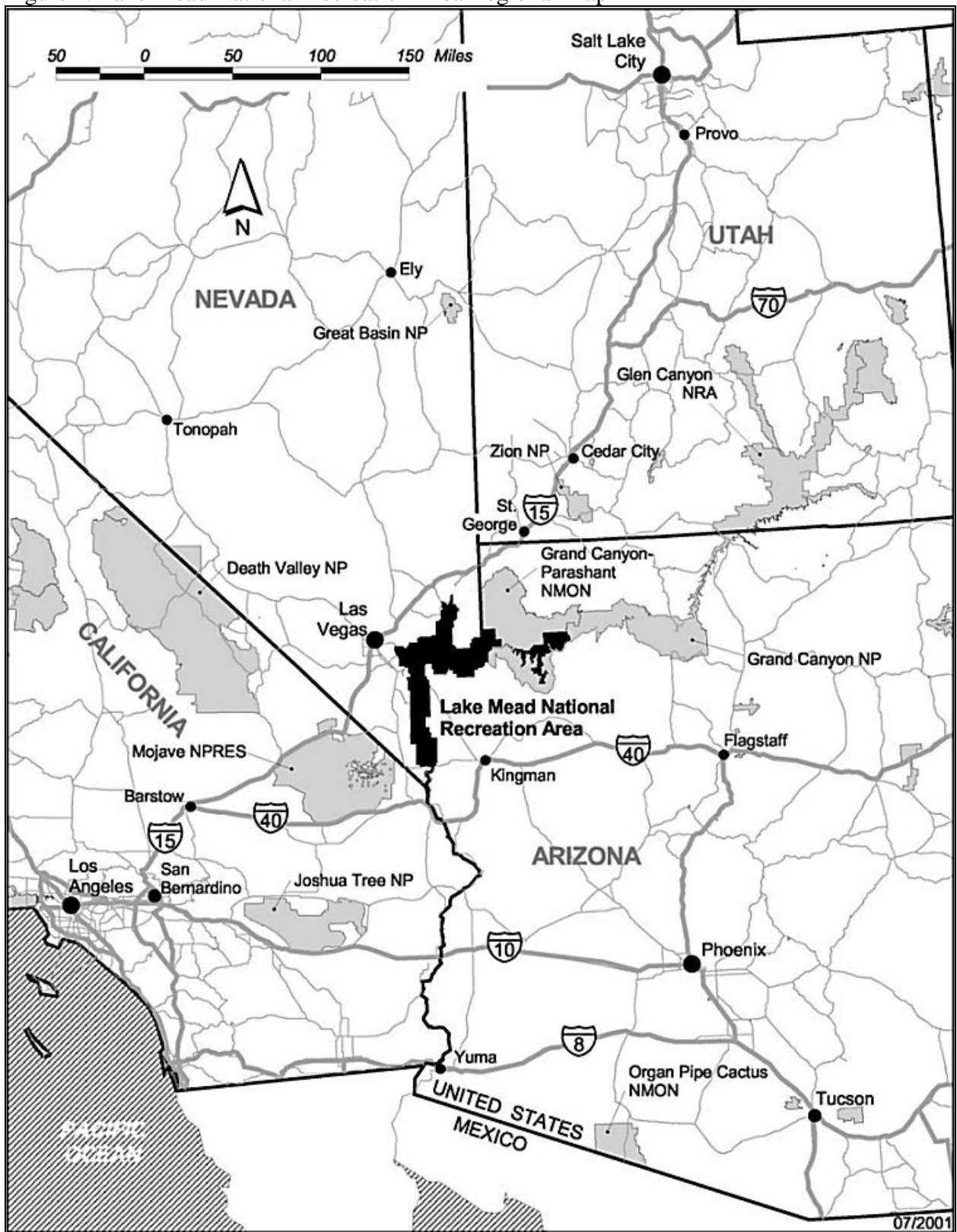
### **Project Location**

Lake Mead NRA is located in southern Nevada and northwestern Arizona. It contains portions of Clark County, Nevada, and Mohave County, Arizona (Figure 1). It includes two reservoirs, Lakes Mead and Mohave, along 140 miles of Colorado River (Figure 2). Lake Mead NRA contains an area on the North Rim of the Grand Canyon, commonly referred to as the Shivwits Plateau. This portion of Lake Mead NRA is included in the newly designated Grand Canyon-Parashant NM. The elevation of Lake Mead NRA ranges from 640 feet in elevation around Lake Mohave, to nearly 7,000 feet at Mt. Dellenbaugh on the Shivwits Plateau of Grand Canyon-Parashant NM

Lake Mead NRA contains 1,501,216 acres of which 1,484,159 acres are in federal ownership administered by the NPS and 12,568 are nonfederal lands. An additional 4,488 acres surrounding Hoover and Davis Dams are administered by the Bureau of Reclamation (BOR) for operations and security purposes. Grand Canyon-Parashant NM contains 1,014,000 acres of land, of which approximately 209,000 acres are within the boundary of Lake Mead NRA and managed by the NPS.

The proposed flights would occur throughout the recreation area. The areas most directly affected would be patrol routes, radio towers sites, and areas requiring resource management attention, such as springs, mine sites, and locations in which animal species of management concern tend to congregate.

Figure 1. Lake Mead National Recreation Area Regional Map



This map illustrates the Lake Mead National Recreation Area and its surroundings. Key features include:

- Geography:** Lake Mead, Lake Mohave, and the Colorado River. The map also shows the Virgin River, Muddy River, and the Colorado River.
- States and Territories:** NEVADA, ARIZONA, and CALIFORNIA.
- Cities and Towns:** LAS VEGAS, BOULDER CITY, HEMENWAY HARBOR, NELSON, COTTONWOOD COVE, SEARCHLIGHT, CAL-NEV-ARI, LAUGHLIN, BULLHEAD CITY, KINGMAN, NEEDLES, MOSQUITO, GLENDALE, LOGANDALE, OVERTON, OVERTON BEACH, ECHO BAY, PEARCE FERRY, MEADVIEW, TEMPLE BAR, DOLAN SPRINGS, PEACH SPRINGS.
- Highways:** 93, 15, 168, 169, 170, 147, 146, 95, 165, 164, 163, 40, 95, 68, 20, 40, 93, 7, 1, 66, 25, 145, 143, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200.
- Landmarks and Reservations:** Grand Canyon-Parashant National Monument, Grand Canyon National Park, Hualapai Indian Reservation, NPS Admin Site, Mojave National Preserve.
- Scale and Orientation:** A scale bar indicates distances up to 30 miles. A north arrow points towards the top of the map.



## **Related Laws, Policies, And Other Planning Documents**

### Service-wide and Park Specific Legislation and Planning Documents

The NPS Organic Act directs the NPS to manage units “to conserve the scenery and the natural and historic objects and the wildlife therein and to provide for the enjoyment of the same in such a manner as will leave them unimpaired for the enjoyment of future generations.” (16 U.S.C. § 1). Congress reiterated this mandate in the Redwood National Park Expansion Act of 1978 by stating that the NPS must conduct its actions in a manner that will ensure no “derogation of the values and purposes for which these various areas have been established, except as may have been or shall be directly and specifically provided by Congress.”

Lake Mead NRA was established in 1964 (PL 88-639), “for the general purposes of public recreation, benefit, and use, and in a manner that will preserve, develop and enhance, so far as practicable, the recreation potential, and in a manner that will preserve the scenic, historic, scientific, and other important features of the area, consistent with applicable reservations and limitations relating to such area and with other authorized uses of the lands and properties within such area.”

The recreation area boundary was modified in 1975 when the *Grand Canyon Expansion Bill* authorized more than 300,000 acres administered by Lake Mead NRA be transferred to Grand Canyon National Park. In 2000, the Grand Canyon-Parashant NM was established. The national monument is jointly managed by the BLM and NPS.

The Grand Canyon-Parashant NM *Presidential Proclamation* (2000) provided the framework for the management of the monument. All planning documents are reviewed for consistency with the Proclamation. Existing management documents were incorporated into one document, the *Current Management Guidance* (2002). This document provides guidance for managing specific activities until the time that BLM and NPS managers complete a management plan for the national monument.

The Organic Act prohibits actions that permanently impair park resources unless a law directly and specifically allows for the acts. An action constitutes an impairment when its impacts “harm the integrity of park resources or values, including the opportunities that otherwise would be present for the enjoyment of those resources and values” (Management Policies 1.4.3).

The *Wilderness Act of 1964*, NEPA (1969), and NPS Management Policies require an assessment of the effects on wilderness values for all designated, proposed, and suitable or potential wilderness areas. *Director’s Order 41: Wilderness Preservation and Management* (1999), aka DO-41, provides guidance for the NPS wilderness management program, and guides NPS efforts in meeting the letter and spirit of the 1964 Wilderness Act.

The Lake Mead NRA original Wilderness Proposal (1979, unpublished) determined that 418,655 acres of recreation area lands met the criteria for wilderness designation and

262,125 acres potentially met the criteria. In 2002, approximately 184,439 acres of Wilderness in the Nevada portion of Lake Mead NRA were designated under the *Clark County Conservation of Public Land and Natural Resources Act of 2002* (Figure 3). Section 208 of the Act discusses wildlife management activities and stipulated that, (b) management activities to maintain or restore fish and wildlife populations and the habitats to support such populations may be carried out within wilderness areas where consistent with relevant wilderness management plans, in accordance with appropriate policies such as those set forth in Appendix B of House Report 101-405, including the occasional and temporary use of motorized vehicles, if such use, as determined by the Secretary of the Interior, would promote healthy, viable, and more naturally distributed wildlife populations that would enhance wilderness values and accomplish those purposes with the minimum impact necessary to reasonably accomplish the task. And, where consistent with section 4(d)(1) of the Wilderness Act (16 U.S.C. 1133(d) and in accordance with appropriate policies such as those set forth in Appendix B of House Report 101-405, the State may continue to use aircraft, including helicopters, to survey, capture, transplant, monitor, and provide water for wildlife populations, including bighorn sheep (Section 208 (c)). In addition, Section 211 of the Act states that “to the extent any of the provisions of this title are in conflict with laws, regulations, or management policies applicable to the National Park Service for Lake Mead National Recreation Area, those laws, regulations, or policies shall control.”

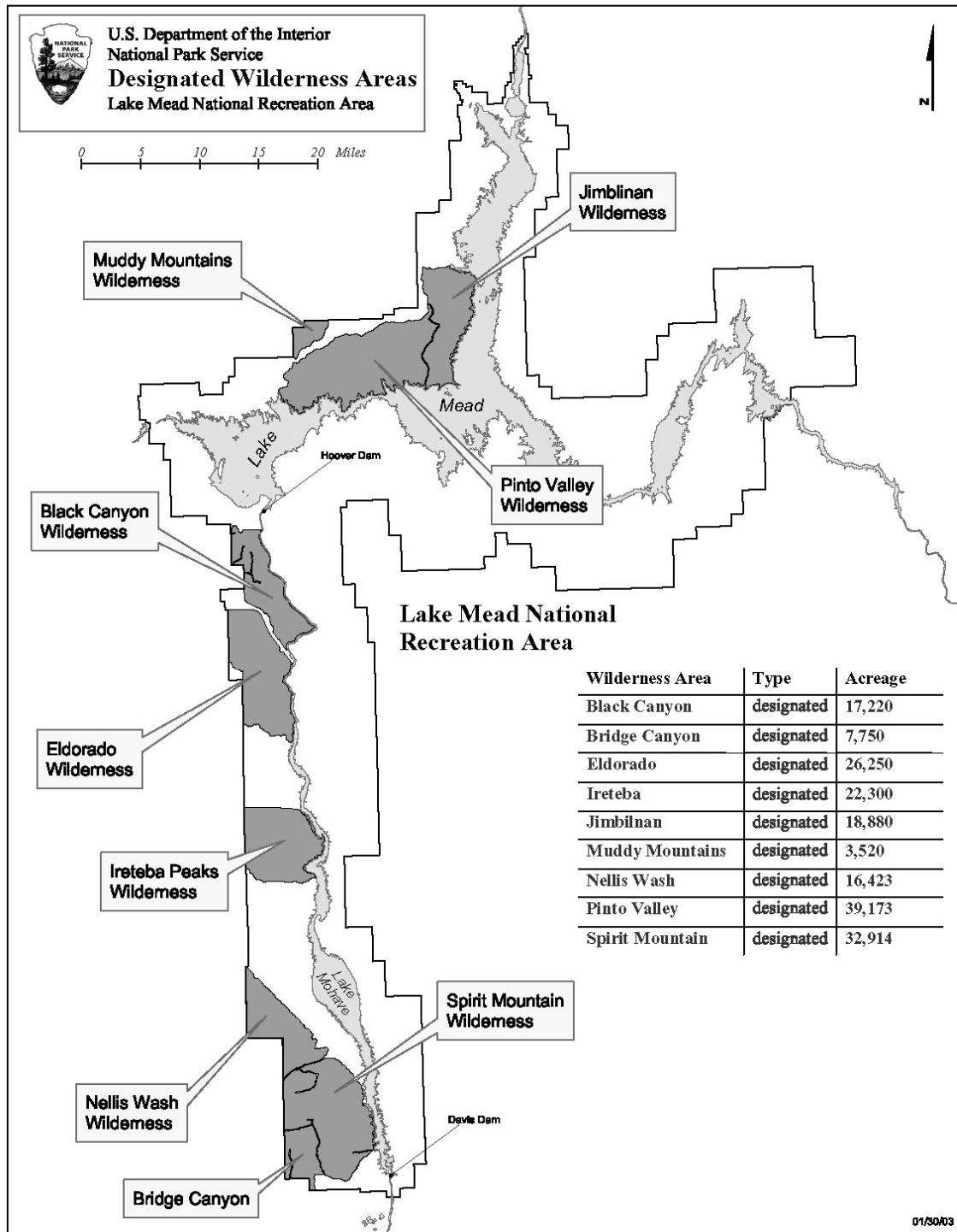
NPS *Management Policies* and DO-41 recommend that a wilderness plan be developed as soon as feasible. The superintendent of each park containing wilderness resources will develop and maintain a wilderness management plan or equivalent document to guide the preservation, management, and use of these resources. The wilderness management plan will identify desired future conditions, as well as establish indicators, standards, conditions, and thresholds above which management actions will be taken to reduce human impacts to wilderness resources.

Lake Mead NRA will initiate wilderness planning in fy2005. Until that time, each action proposed in wilderness will be reviewed in accordance with the Lake Mead NRA Interim Guidelines for Wilderness Management (Appendix A) and the appropriate compliance will be completed.

In accordance with DO-41, managers contemplating the use of aircraft or other motorized equipment within wilderness must consider impacts to the aesthetics and traditions of wilderness, as well as the efficiency of the equipment.

All designated, proposed, and proposed potential wilderness areas are managed to preserve the wilderness values. In addition, a minimum requirement analysis will be utilized to determine the appropriate management activities in the affected wilderness areas (Appendix A). In accordance with NPS *Management Policies* (6.3.5), all management decisions affecting wilderness must be consistent with a minimum requirement concept. When determining the minimum requirement, the potential disruption of wilderness character and resources will be considered before, and given significantly more weight than, economic efficiency and convenience. Public input is

Figure 3. Designated Wilderness Units



sought in this process. If a compromise of wilderness resource or character is unavoidable, only those actions that preserve wilderness character and/or have localized, short-term adverse impacts will be acceptable.

NPS Management Policies 2001 requires the analysis of potential effects of each alternative to determine if actions would impair park resources. To determine impairment, the NPS must evaluate “the particular resources and values that would be affected; the severity, duration, and timing of the impact; the direct and indirect effects of the impact; and the cumulative effects of the impact in question and other impacts.” (Management Policies 1.4.4). The NPS must always seek ways to avoid or minimize, to the greatest degree practicable, adverse impacts on park resources and values. However, the laws do give the NPS management discretion to allow impacts to park resources and values when necessary and appropriate to fulfill the purposes of a park, as long as the impact does not constitute impairment to the affected resources and values (Management Policies 1.4.3).

NPS units vary based on their enabling legislation, missions, natural and cultural resources, and the recreational opportunities appropriate for each unit. This environmental assessment analyzes the context, duration, and intensity of impacts related to the alternatives associated with conducting aerial activities, as well as the potential for resource impairment, as required by Director’s Order 12, *Conservation Planning, Environmental Impact Analysis and Decision Making*.

The 1986 Lake Mead NRA *General Management Plan (GMP)* provided the overall management direction for Lake Mead NRA. It established management zones to accommodate increasing visitor use while protecting park resources.

The 1998 Lake Mead NRA Strategic Plan established goals relating to resource protection. The 2001 Strategic Plan has reaffirmed these goals. Goal 1.a.2.X: Native Species of Special Concern, captures park efforts to manage species of special concern (plants and animals) that are not federally listed as threatened, endangered, or nonnative. These includes species identified in the park’s resource management plans as having special significance to the park, or species on adjacent lands managed by other state or federal agencies where park habitat supports those species. These include charismatic species as well as state listed sensitive species and those covered in the Clark County Multi-Species Habitat Conservation Plan.

The 2001 Strategic Plan discusses the following goals and resource issues. Goal 1.a.1.A. Disturbed Lands, directs park managers to restore 5% of targeted acres of Lake Mead NRA that have been disturbed by prior physical development or past land use, including impacts from roads, illegal off-road driving, mines, and other abandoned sites. This goal calls for containment of invasive plant and animal species, removal or better management of grazing, expanding the role of natural fire, and riparian restoration.

Goal 1.a.1.B. Exotic Plant Species, directs park managers to focus on removing nonnative species from riparian areas associated with park springs. Goal 1.a.1.C.

(LAME) Exotic Animals, directs park managers to reduce burro populations within the recreation area so that they do not exceed, by greater than 10%, parkwide targeted numbers as outlined within the 1995 Burro Management Plan.

Goals 1.a.2.A and 1.a.2.B. focus on the management and recovery of threatened and endangered species. These goals respond to the NPS Organic Act and to the Endangered Species Act which require federal agencies to develop programs for the conservation of listed species and reflects the NPS responsibility to know the condition of its resources. The populations consist of those threatened and endangered species with critical habitat on parklands as well as those species requiring NPS recovery actions. These goals include all efforts expended by the park in preserving, protecting, restoring, maintaining, monitoring, or evaluating the habitat of all threatened and endangered species in the park and all efforts expended in mitigating any impacts that affect critical habitat or the threatened and endangered species populations.

#### Other Related Planning Documents

The projects and activities evaluated within this environmental assessment are related to previous, ongoing, and future planning efforts within the recreation area. The Lake Mead NRA Air Operations Plan determined the frequency and necessity of aerial patrols within the recreation area. The Lake Mead NRA *Burro Management Plan and Environmental Impact Statement* (1995) provides the framework for burro management activities within Lake Mead NRA. The NDOW *Bighorn Sheep Management Plan* (2001) serves as a guiding document for the Nevada Board of Wildlife Commissioners and NDOW in the conservation and management of bighorn sheep populations and their habitat. The plan outlines the actions and strategies that assist in planning and conducting bighorn sheep management and conservation. The underlying goal of the plan is to restore and maintain herds at optimal population levels based on a multitude of demographic and ecological parameters. AGFD's management of bighorn sheep is guided by the *Department's Strategic Plan (Wildlife 2006)* and the *Arizona Strip Desert Bighorn Sheep Management Plan* (2001).

The Lake Mead NRA and Grand Canyon-Parashant NM *Fire Management Plan* addresses fire management activities, including the use of fire in restoration, within the recreation area and on the Lake Mead NRA portion of Grand Canyon-Parashant NM.

The National Parks Air Tour Management Act of 2000 (NPATMA) specifies that the impacts of air tours on national parks are to be evaluated in an Air Tour Management Plan, where NPS has cooperating agency responsibilities associated with its special expertise in determining impacts on park resources. The NPS at Lake Mead NRA is currently participating in the development of an Air Tour Management Plan with the Federal Aviation Administration.

In the future, a wilderness management plan will be prepared for the recreation area to establish the goals, objectives, and guidelines for wilderness-related projects in the recreation area.

## **Environmental Assessment**

This environmental assessment (EA) analyzes one action alternative and the no action alternative and includes the impacts of each on the human and natural environment. It outlines project alternatives, describes existing conditions in the project area, and analyzes the effects of each project alternative on the environment. This EA has been prepared in accordance with the National Environmental Policy Act (NEPA) of 1969 and regulations of the Council on Environmental Quality (CEQ) (40 Code of Federal Regulations [CFR] 1508.9).

## **Issues and Impact Topics**

Issues are related to potential environmental effects of project alternatives and were identified by the project interdisciplinary team. Once issues were identified, they were used to help formulate the alternatives and mitigation measures. Impact topics based on substantive issues, environmental statutes, regulations, and executive orders (EOs) were selected for detailed analysis. A summary of the impact topics and rationale for their inclusion or dismissal is given below.

## **Issues and Impact Topics Identified for Further Analysis**

The following relevant impact topics are analyzed in the EA. These include issues related both to taking action and to no action.

### Wildlife and Wildlife Habitat, Species of Concern

Wildlife could be temporarily disrupted or displaced from flight activities. Noise caused by aircraft, particularly low-level helicopters, could disturb the normal activities of wildlife in the project areas. The impacts from aerial operations to critical wildlife habitat, including desert bighorn sheep lambing areas, mule deer habitat, peregrine falcon nesting areas, and bald eagle roosting areas are evaluated within the document.

### Natural Soundscapes

Natural soundscapes are the audio equivalent of natural scenic properties of the park. Blowing wind, singing birds, and many other sounds are part of the natural setting. Mechanical noises, such as those produced by aircraft, can drown out these natural sounds on a temporary or recurring basis. This can affect natural ecological processes that are dependent upon sound, as well as visitor experiences and expectations that are dependent upon natural settings including wilderness.

### Visitor Experience

The proposed flights could temporarily disturb visitors in wilderness who have expectations of enjoying natural sounds, sights, and solitude. The health and safety of visitors in need of search and rescue or other emergency services could be compromised if the park's radio system is not functioning properly.

### Wilderness

Lake Mead NRA has 184,439 acres of designated and approximately 493,000 acres of suitable or potential wilderness. The Lake Mead NRA portion of Grand Canyon-Parashant NM contains approximately 280,000 acres of proposed and potential

wilderness. The proposed flights could impact wilderness values. In accordance with DO-41, managers contemplating the use of aircraft or other motorized equipment within wilderness must consider impacts to the aesthetics and traditions of wilderness, as well as the costs and efficiency of the equipment. A minimum requirement analysis will be completed as part of this planning effort.

#### Park Operations

The proposed flights influence the park's ability to perform maintenance on radio towers, to provide for visitor safety and enjoyment, to implement restoration activities, and to monitor and protect wilderness resources. Park staff and cooperators would be negatively impacted if the park radio system is not functioning properly.

### **Impact Topics Considered but Dismissed From Further Consideration**

The following topics are not addressed in the EA but may be considered, as appropriate, in other project-specific analyses following completion of this EA.

#### Soils and Vegetation

Although helicopters may land temporarily on soils and vegetation for some projects, these effects would be negligible. Therefore, soils and vegetation were dismissed as an impact topic.

#### Special Status Species

Although the bald eagle is federally listed as threatened, this species will be addressed under the topic of Wildlife, Wildlife Habitat, and Sensitive Species. Therefore, this topic will not be further evaluated.

#### Water Resources, Wetlands, and Floodplains

Water may be needed for projects involving animal trapping, but this would be temporary and would have negligible effects. No landings would occur in or near water, and floodplains would not be obstructed. Therefore these topics will not be further evaluated.

#### Air Quality

Aircraft have negligible, localized, short-term adverse effects on air quality. However, no measurable impacts are expected, therefore this topic will not be further evaluated.

#### Cultural Resources

Implementation of the proposed aerial operations associated with the management activities would have no effect on cultural resources. Therefore, this topic will not be further evaluated.

The following topics are not further addressed in this document because there are no potential effects to these resources, which are not in the project area:

- Socioeconomic resources
- Designated ecologically significant or critical areas;

- Wild or scenic rivers;
- Designated coastal zones;
- Indian Trust Resources;
- Ethnographic Resources;
- Prime and unique agricultural lands;
- Sites on the US Department of the Interior's National Registry of Natural Landmarks; or
- Sole or principal drinking water aquifers.

In addition, there are no potential conflicts between the project and land use plans, policies, or controls (including state, local, or Native American) for the project area.

Regarding energy requirements and conservation potential, aerial operations would require the increased use of energy. However, overall, the energy from petroleum products required to implement the action alternative would be insubstantial when viewed in light of production costs and the effect of the national and worldwide petroleum reserves.

There are no potential effects to local or regional employment, occupation, income changes, or tax base as a result of this project. The project area of effect is not populated and, per EO 12898 on Environmental Justice, there are no potential effects on minorities, Native Americans, women, or the civil liberties (associated with age, race, creed, color, national origin, or sex) of any American citizen. No disproportionate high or adverse effects to minority populations or low-income populations are expected to occur as a result of implementing any alternative.



---

## **SECTION II: DESCRIPTION OF ALTERNATIVES**

---

### **INTRODUCTION**

This section describes the alternatives considered, including the no action alternative. The alternatives described include mitigation measures and monitoring activities proposed to minimize or avoid environmental impacts. This section also includes a description of alternatives considered early in the process but later eliminated from further study, and reasons for their dismissal are provided. The section concludes with a comparison of the alternatives considered.

### **ALTERNATIVE A – No Action**

Under this alternative, no new aerial operations would be permitted to occur over wilderness areas until completion of a wilderness management plan, which may or may not amend interim management decisions. No fixed-wing patrols would occur over wilderness. Other options for access and the transportation of materials would be considered for each management action under this alternative, including access by foot, horse or other pack animal, boat, or by vehicle where roads are present.

### **Law Enforcement Patrols**

Under this alternative, no fixed wing patrols would be permitted over designated or suitable wilderness areas within the recreation area. All law enforcement and resource patrols within wilderness areas would be accomplished by other methods, including vehicle patrols on approved roads, boats or other motorized vessels, foot travel, or by horseback.

### **Radio Tower Maintenance**

Alternative routes or methods would be used to conduct radio tower maintenance at Mount Wilson, Grand Wash, Mount Perkins, and Virgin Mountain. Alternative aerial access routes that avoid wilderness would be utilized for aerial access to each site except Mt. Wilson, where this is not possible because Mt. Wilson is surrounded by suitable wilderness (lands determined to be suitable under the Wilderness Act criteria).

At the Mt. Wilson site, park employees and/or contractors would drive on Approved Roads 66 and 66A to get as close to the site as possible, and then hike 3 miles to the site to do the repairs. Some repairs may be delayed until conditions are suitable for hiking into the site. Some repairs may not be possible due to the size and weight of the necessary equipment, and the circuitous, steep route to the tower.

### **Wildlife Surveys and Management**

The use of helicopters for NPS and joint partnership activities would not be permitted in wilderness areas. Censusing and monitoring of bighorn sheep and burros would occur using vehicles on approved roads outside of wilderness, or by foot or horse travel into wilderness units. Capture operations for bighorn sheep and burros would occur outside of wilderness areas, or would use other methods, such as horseback and roping and corral trapping (burros only), and drop nets (sheep only).

Fish surveys for razorback suckers would be accomplished using boats on Lake Mohave, and would occur once a week from the Chalk Cliffs to Princess Cove. At least two boats would be used, with one boat surveying the east side of the lake, and one boat surveying the west side. Raptor surveys would be conducted by vehicle on roads outside of wilderness, on foot, or by boat.

### **Resource Management Activities**

Spring restoration would be accomplished by hiking into the project site. If needed, horses or other pack animals could be used in areas where the terrain permits. In some areas, projects would take more time to complete under this alternative, and it may not be possible to get all equipment to all sites. Extremely rugged terrain would add significant safety concerns to people hauling in heavy loads of gear.

The closing and rehabilitation of several mines within the recreation area would be accomplished by transporting equipment and supplies utilizing other methods. Methods that would be employed would depend upon the site, and could include driving vehicles to the mine sites, using wagons and pack animals, and using crews to hike supplies into the mine sites.

### **Operations on the Grand-Canyon Parashant NM portion of Lake Mead NRA**

The Arizona Game and Fish Department would conduct deer surveys and monitor wildlife water catchments utilizing other methods, including surveys on approved roads with vehicles, foot travel, or by horseback.

General resource monitoring including monitoring Ponderosa pine forests and wilderness monitoring would be accomplished by foot travel, horseback, or by vehicles using approved roads.

Law enforcement would not use fixed-wing aircraft or helicopters for patrolling or monitoring. These patrols would be accomplished utilizing foot travel, vehicles on the approved road system, or by horseback.

### **ALTERNATIVE B - Conduct Administrative Helicopter and Fixed-Wing Flights (Management Preferred Alternative)**

#### **Continue Fixed-Wing Aerial Patrols (Minimum 2 flights per week/104 flights per year)**

Fixed-wing aerial patrols are conducted by the NPS Park Pilot at least two times a week, in accordance with the Lake Mead NRA Aerial Operations Plan. The purposes of the flights are routine law enforcement patrol, backcountry patrol, damage assessments, employee transport, search and rescue, boat counts, employee orientation flights, wildlife monitoring, and special request flights. These flights are primarily 800 to 1,000 above ground level, though they could go as low as 700 feet above ground level for optimum viewing.

In addition, AGFD also performs fixed-wing aerial patrols 5-10 times per year with the purpose of identifying violations of state law including illegal hunting and off-road driving. These flights temporarily pass over NPS proposed wilderness, with a duration less than 15-20 minutes, and at an altitude of approximately 700 feet. Lower levels are used at times when needed for better identification of violations.

#### **Radio Tower Maintenance (Minimum 2 flights per site per year/minimum 8 flights per year total)**

Communication among park personnel is considered a priority for the park for safety and emergency services. When there is a need to repair radio towers and replace tower batteries, this work must be completed immediately. NPS radio towers require routine maintenance and servicing. On average, each radio tower is serviced twice a year, unless emergency maintenance is required.

The radio towers are located at Mount Wilson, Grand Wash, Mount Perkins, and Virgin Mountain. The Mount Wilson repeater is the only site located within suitable wilderness on Mount Wilson, Arizona. All other sites are located outside wilderness, and can be accessed without flying over designated or suitable wilderness. The Grand Wash repeater is located outside the recreation area in the Arizona Strip portion of Grand Canyon Parashant National Monument outside of wilderness. The Mount Perkins repeater is located outside of wilderness in the Black Mountains, Arizona, on Bureau of Land Management administrated lands. The Virgin Mountain repeater is located outside the recreation area, outside of wilderness, near Virgin Peak within Bureau of Land Management administrated lands.

#### **Wildlife Surveys, Monitoring, and Removal**

##### Burro and Horse Management Activities

Burro management within Lake Mead NRA is authorized under the 1995 Burro Management Plan and Environmental Impact Statement. This alternative includes only the aerial portion of burro management, and does not include any modifications to the existing program within the recreation area. Under this alternative, burro management activities would include aerial helicopter census, capture and removal of burros, and capture and sterilization activities.

In census operations, burros are located from a helicopter flying grid patterns over relatively flat country and following contours in canyons and more mountainous terrain. The helicopter flies at 200 feet to 500 feet above ground level in a predetermined grid in order to maintain a reliable sighting rate and to ensure the statistical accuracy of the population estimate. Flight speed is 40 to 60 miles per hour (mph). GPS locations are recorded for each animal, and a line feature is recorded to document the actual flight pattern flown.

Burro capture and removal activities are generally planned based on census and utilization data and occur in areas heavily impacted by burros, areas where zero burro use is the recreation area's goal under the approved Burro Management Plan, or areas where

they are posing a nuisance or risk to public safety. In removal operations, a helicopter searches for burros, flying at approximately 700 feet above ground level. Once burros are found, a group is herded by the helicopter toward a trap site. While herding, the helicopter is generally flying between 200 feet and 500 feet above ground level. The search periods can take as little as 30 minutes to as long as 2 hours. Once burros are located, the herding period depends on the distance to the trap. Burros are generally herded no more than 4 miles to a trap site, and no faster than 10 miles per hour. Operations can be completed in as little as several hours, to as long as five days, depending on the weather, the size of the removal area, and the number of burros to be removed.

Horse management activities are conducted in cooperation with the BLM on an as-needed basis for trespass horses and when range conditions warrant removals. These operations occur in conjunction with burro management activities.

#### Desert Bighorn Sheep Management Activities, Nevada

Under this alternative, NPS and joint partnership activities with Nevada Department of Wildlife for bighorn sheep management would include aerial helicopter surveys, affixing telemetry collars for scientific study and, if determined appropriate, capture and relocation of selected bighorn sheep. Activities may also include the removal of trespass or escaped exotic species, such as domestic goats or sheep, which pose a threat to bighorn. Survey activities involve several hours of helicopter flight time at low elevations, frequently 200 feet above ground level or lower for the purpose of conducting a routine annual census of desert bighorn sheep populations. Population estimates and demographic data collected would be used to set sustainable harvest quotas and inform managers of current herd conditions and trends. Historically, such operations rarely exceed one day of activity annually over any given mountain range or wilderness unit.

#### Desert Bighorn Sheep Management Activities, Arizona

This program is similar to the Nevada Desert Bighorn Sheep management program. NPS in joint partnership operations with AGFD actively manage bighorn sheep on park lands. Low-level fixed wing and helicopter flights can occur for annual surveys, transplant, capture and release programs, removal activities, post release monitoring, population demographic studies, and scientific research. Survey activity includes low level helicopter flights, frequently 200 feet or less, approximately 3 to 5 days per year in the Tassi, Grand Wash, the Cockscomb, and Andrus Canyon areas of Grand Canyon-Parashant NM. Scientific research and post release monitoring activities could result in low-level fixed wing and helicopter flights 1 to 3 times per week during the study period. In addition, the level of activity historically includes aerial census for approximately 1 to 2 weeks in the Black Mountains and Temple Bar areas, Arizona, during the late summer and fall, and low level helicopter flights are used to conduct these operations.

#### Native Fish Monitoring

Between January and March, the Native Fish Work Group, which includes representatives from the NPS, Bureau of Reclamation, Nevada Department of Wildlife, Arizona Game and Fish Department, U.S. Fish and Wildlife Service, and Arizona State

University, conduct helicopter surveys of the coves along Lake Mohave and Lake Mead to determine the presence of spawning razorback suckers. The flights primarily occur outside the wilderness areas and follow the shoreline of the lakes.

Flights generally occur at or below 500 feet above ground level. Lake Mohave flights follow the west shoreline from Hoover Dam south to Davis Dam, then follow the east shoreline north from Davis Dam, or vice versa. Northern sections of the surveys include Black Canyon, and the flights could occur over designated wilderness due to the nature of the terrain. Flights take approximately 2 to 3 hours each.

Lake Mead is periodically surveyed for razorback sucker spawning, though not as frequently as Lake Mohave. These flights are generally over the lake and not within the wilderness units.

#### Raptor Surveys

During April and May of 2006, NDOW would use a helicopter to survey for nesting raptors in the Muddy, Black, River, Eldorado, and Newberry Mountains. The estimated total survey time would be 20 to 24 hours. There would be no landing in wilderness areas except in an emergency.

#### **Resource Management Activities**

Resource management activities that occur in remote locations of the park sometimes require the use of helicopters to haul equipment to and from the project site. Under this alternative, helicopters would be used to haul heavy equipment into areas with rugged terrain and no road access. Typical projects would include spring restoration (including tamarisk removal native replanting) and mine closures and restoration. If necessary, helicopters would be used to provide for emergency medical evacuations from the project site. Aerial photographic documentation may also occur on some projects.

#### **Additional Proposed Aerial Operations on the Grand-Canyon Parashant NM portion of Lake Mead NRA**

##### Wildlife Monitoring

The Arizona Game and Fish Department conducts deer surveys approximately 2 to 4 days per year utilizing low level helicopters on the Shivwits portion of the national monument. Deer surveys normally occur annually in December or January over Twin Point and the Mt. Dellenbaugh areas. These flights typically utilize a low-level helicopter but could be also utilize a fixed-wing aircraft, depending on available funding.

Aerial patrols utilizing both fixed-wing and helicopters occur over the wildlife water catchments at Paws Pocket and Mollies Nipple to monitor wildlife and water conditions.

### General Resource Monitoring

There are occasional overflights scheduled over Ponderosa pine forests to look for evidence of bark beetle infestation. This occurs 1 to 2 days per year.

Wilderness monitoring surveys occur 2 to 3 times per year in fixed-wing aircraft at or above 700 feet, but are generally 800 to 1,000 above ground level.

Surveys to monitor range activities, including overflights to look for trespass cattle, can occur 4 to 5 times per year and generally occur in the Grand Wash and Tassi areas in a fixed-wing aircraft at or above 700 feet, but are generally 800 to 1,000 above ground level.

NPS and BLM law enforcement monitoring flights and orientation flights occur approximately 2 to 3 times per year in fixed-wing aircraft at or above 700 feet, but are generally 800 to 1,000 above ground level.

AGFD fixed-wing aerial patrols occur 5-10 times per year, at various times, with the purpose of identifying violations of state law including illegal hunting and off-road driving. These flights temporarily pass over NPS proposed wilderness, with a duration less than 15-20 minutes, and at an altitude of approximately 700 feet. Lower levels are used at times when needed for better identification of violations.

## **MITIGATION, MONITORING, AND OPERATIONS SAFETY**

Mitigation measures are specific actions designed to minimize, reduce, or eliminate impacts of alternatives and to protect Lake Mead NRA and Grand Canyon-Parashant NM resources and visitors. Monitoring activities are actions to be implemented during or following the project. The following mitigation related to aerial operations use would be implemented under the action alternative, and are assumed in the analysis of effects.

- Low level aerial operations (below 700 feet above ground level) would not occur during sensitive periods for species of concern, as recommended by the NPS wildlife biologist. Sensitive periods for bighorn sheep include the peak mating period between July 1 and September 30 and the lambing period in February and March. Low level census and capture operations would avoid these periods to the extent practicable; limited activity may occur when needed to meet management goals.
- All helicopter operations, other than those for wildlife and burro censusing and removals, would fly at a minimum of 500 feet above ground level except when landing or taking off, or when delivering supplies on a long-line.
- Fixed-wing aircraft would fly at a minimum of 700 feet above ground level. Short-duration flights at lower altitudes may be used for identification of wildlife or illegal activities.
- Whenever possible, trap sites would be located outside of wilderness areas, near existing roads and developed areas, adjacent to the lake, or in desert washes or previously disturbed areas. If possible, aerial trapping operations would be scheduled during periods of low visitor use in wilderness areas.
- A separate job safety analysis will be prepared for all NPS aerial operations. All aerial operations would be conducted in accordance with applicable state and federal laws and policies. Only qualified and trained individuals would be permitted on the aerial operations.
- A flight manager would be assigned to all NPS aerial operations to ensure that all regulations are met, safety is observed, and sensitive areas are avoided.
- Notification of aerial operations over wilderness will be provided to the public through the park web site, press releases, and at the park visitor centers. The base of all operations would be located outside wilderness. All ground support vehicles would be restricted to existing access roads, outside of the designated wilderness.
- For radio tower maintenance activities, only designated helicopter landing areas would be utilized, except for in emergency situations.

Monitoring activities for wilderness have been funded through the Conservation Initiative of the Southern Nevada Public Lands Management Act; these activities include

assessments of trail impacts and impacts from off-road vehicle use. Development of a wilderness management plan has been funded and will be initiated in 2005.

## **ALTERNATIVES CONSIDERED BUT ELIMINATED FROM FURTHER EVALUATION**

One alternative considered for accomplishing wildlife surveys was using fixed-wing aircraft. This is utilized when helicopters are not available, or when budgetary restraints do not allow the use of helicopters. This alternative does not provide optimal censusing conditions because the blind spot from the fixed wings on the aircraft makes it difficult for counting, and the impacts from the aircraft would be equally or more intrusive than using helicopters. Another alternative considered for accomplishing wildlife surveys was using cameras at guzzlers or watering holes. This alternative was eliminated from further consideration because cameras at springs would not give reliable population estimates without long-term study, and it would still require the checking of animals on the ground or by air.

## **CONSULTATION, COORDINATION, AND PERMIT REQUIREMENTS**

A press release was provided to area newspapers on September 24, 2004 to announce the 30-day scoping period (Appendix B). One comment was received from an individual supporting the use of aircraft for patrol and safety purposes.

In addition, the following consultation and coordination will occur as part of this environmental assessment.

- Public distribution and review of EA (30 days)
- Public notification of activities proposed to occur in Wilderness
- Coordination with BLM
- Tribal Consultation

## **ENVIRONMENTALLY-PREFERRED ALTERNATIVE**

The environmentally preferred alternative is the alternative that will promote NEPA, as expressed in Section 101 of NEPA. This alternative will satisfy the following requirements:

- Fulfill the responsibilities of each generation as trustee of the environment for succeeding generations;
- Assure for all generations safe, healthful, productive, and esthetically and culturally pleasing surroundings;
- Attain the widest range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable or unintended consequences;



- Preserve important historic, cultural, and natural aspects of our national heritage and maintain, wherever possible, an environment that supports diversity and variety of individual choice;
- Achieve a balance between population and resource use that will permit high standards of living and a wide sharing of life's amenities; and,
- Enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.

Alternative B is the environmentally preferable alternative because overall it would best meet the requirements in Section 101 of NEPA. It would assure for all generations a safe, healthful, and esthetically pleasing surrounding.

Wildlife management and monitoring activities would be accomplished within the recreation area. Given the globally significant populations of desert bighorn sheep at Lake Mead, implementation of bighorn management activities would help preserve important natural aspects of our national heritage and would maintain an environment that supports diversity and variety of individual choice.

Resource management and protection would be accomplished through the closure of mines and the removal of non-native plant and animal species using the most effective methods. Protection of sensitive resources would be accomplished through patrols and aerial monitoring activities.

Visitor and employee protection would be enhanced by the maintenance and upkeep of the park communication system.

Alternative B would allow park managers to achieve a balance between population and resource use, and permit high standards of living and a wide sharing of life's amenities.

## COMPARISON OF IMPACTS

Table 1 summarizes the potential long-term impacts of the proposed alternative. Short-term impacts are not included in this table, but are analyzed in the Environmental Consequences section. Impact intensity, context, and duration are also defined in the Environmental Consequences section.

Table 1. Potential Long-Term Impacts

<b>IMPACT TOPICS</b>	<b>ALTERNATIVE A (No action)</b>	<b>ALTERNATIVE B (Preferred)</b>
Wildlife, Wildlife Habitat	Potential for moderate to major adverse impacts.	Beneficial long-term effects.
Soundscapes	No impacts. Continued adverse cumulative impacts.	No long-term impacts.
Visual Resources	No impacts	No long-term impacts. Continued adverse cumulative impacts.
Visitor Experience	Potential for moderate to major adverse impacts. Continued adverse cumulative impacts.	Beneficial impacts. Continued adverse cumulative impacts.
Safety and Park Operations	Potential for moderate to major adverse impacts.	Potential for moderate adverse impacts and beneficial impacts.
Wilderness	Potential for minor to major impacts. Continued adverse cumulative impacts.	No long-term impacts from project. Continued adverse cumulative impacts.

---

## **SECTION III: AFFECTED ENVIRONMENT**

---

### **INTRODUCTION**

This section provides a description of the existing environment in the project area and the resources that could be affected by implementing the proposed alternatives. Complete and detailed descriptions of the environment and existing use at Lake Mead NRA is found in the *Lake Mead NRA Resource Management Plan* (NPS 1999), the *Lake Mead NRA General Management Plan* (NPS 1986), the *Lake Mead NRA Lake Management Plan* (NPS 2002), and on the Park website at [www.nps.gov/lame](http://www.nps.gov/lame).

### **LOCATION AND GENERAL DESCRIPTION OF LAKE MEAD NRA AND LAKE MEAD NRA PORTION OF GRAND CANYON-PARASHANT NM**

Lake Mead NRA was designated as the first National Recreation Area in 1964. Lake Mead is located in southern Nevada and northwestern Arizona, about 20 miles southeast of Las Vegas, Nevada, and about 5 miles north of Bullhead City, Arizona, and Laughlin, Nevada (Figure 1). It consists of two larger reservoirs (Lakes Mead and Mohave) formed by the Colorado River. The recreation area is approximately 1.5 million acres in size, with about 87% of that acreage being terrestrial resources. About 60% of the total acreage is within the state of Arizona, in Mohave County, and 40% of the total acreage is in the state of Nevada, in Clark County.

Lake Mead NRA users include boaters, swimmers, fishermen, hikers, hunters, photographers, roadside sightseers, backpackers, campers, and bicyclists. Recreation visits in 2002 totaled just over 7.8 million (NPS 2002).

Grand Canyon-Parashant NM is managed jointly by the NPS and BLM as the Grand Canyon-Parashant NM. Most of the northern boundary is adjacent to BLM administered lands and the southern and eastern boundaries are adjacent to Grand Canyon National Park (NP). The Lake Mead NRA portion of Grand Canyon-Parashant NM is an extremely remote area within the Arizona Strip located on the northwest rim of the Grand Canyon. The nearest community is St. George, Utah which lies 90 miles to the north. Most of the area is without roads; access to the area is via unpaved dirt roads with varying road conditions. There are no major developed areas within Grand Canyon-Parashant NM.

### **NATURAL RESOURCES**

The majority of the project area is characteristic of the Mojave Desert, with low precipitation (averaging 8 to 23 centimeters per year [3 to 9 inches per year]), low humidity, and wide extremes in daily temperatures. Winters are relatively short and mild, and summers are long and hot. The prevailing wind direction is from the south during the summer, and from the north during the winter. The Lake Mead NRA portion of Grand Canyon-Parashant NM, commonly referred to as the Shivwits Plateau is located in the junction of two eco-regions. This area ranges from the arid creosote flats of the lower Mojave Desert along Lake Mead to the pinyon-juniper lands of the higher Colorado Plateau (NPS 2005).

### Geology, Topography, and Soils

Lake Mead NRA is characterized by generally north-south trending mountain ranges separated by broad, shallow valleys. The mountains are dissected by deep ravines opening into broad alluvial fans. Adjoining fans commonly coalesce and form a continuous alluvial apron along the base of the mountains. The underlying strata of these slopes consist chiefly of Tertiary and Quaternary deposits.

Sedimentary rock layers of the Paleozoic and Mesozoic times, evident in the Lake Mead NRA portion of the Grand Canyon-Parashant NM, have been exposed by the eroding Colorado River. Several tributaries of the Colorado River carved out canyons at the south end of the Shivwits Plateau. Volcanic events occurring 9 million to 1,000 years ago produced volcanic rock, cinder cones, and basalt flows which shaped the plateau (NPS 2005).

### Vegetation and Wildlife, Sensitive Species

#### **Low Desert Region**

The dominant community in the low desert region is the creosote bursage community. Grasses rarely occur in this community. The threatened desert tortoise (*Gopherus agassizii*) occurs throughout this region, and critical habitat for the tortoise has been designated within the recreation area. Peregrine falcons (*Falco peregrinus anatum*) have been recorded nesting along the shoreline cliffs of Lakes Mead and Mohave, and bald eagles (*Haliaeetus leucocephalus*) winter in the park from November to March. Other sensitive fauna and flora that can be found in this zone include the banded Gila monster (*Heloderma suspectum*) and the Las Vegas bearpoppy (*Arctomecon californica*). There are several special plant communities found within this area such as the stem-succulent scrub community near Cottonwood Cove. The Newberry Mountains area, in the southern portion of the recreation area, is composed of a pinyon-juniper/oak/shrub community.

Lake Mead NRA contains internationally significant populations of desert bighorn sheep (*Ovis canadensis*). Bighorn sheep enjoy great "heroic" species popularity with park visitors, local residents, and with bighorn sheep hunters (bighorn hunting being a legislated activity within the park).

Desert bighorn sheep are relatively common in the rugged terrain of the recreation area. Desert bighorn sheep population management involves surveying bighorn numbers and distribution, delineating subspecies distribution boundaries, capturing and transplanting bighorns, disease detection and control, and evaluating and controlling predators. The underlying goal of bighorn sheep management is to maintain bighorn herds at optimal levels, as determined by a number of demographic and ecological parameters.

The sensitive species considered when determining the effects of the proposed projects include the desert bighorn sheep, peregrine falcon, and bald eagle.

### **The Shivwits Plateau**

There are three main habitat types on the Shivwits Plateau: including pinyon-juniper, ponderosa pine, and sagebrush.

There are several administrative sites, historical sites, and two special plant populations that occur on the Shivwits Plateau. This is also an area with numerous historic and cultural resources.

This area includes approximately 168,000 acres of sagebrush (*Artemisia tridentata*), pinyon (*Pinus monophylla*) - juniper (*Juniperus osteosperma*) woodlands, and ponderosa pine (*Pinus ponderosa*) communities. Elevations average around 6,000 feet, and the area averages 14 to 18 inches of rainfall per year.

These areas provide habitat for a variety of wildlife species, including mule deer (*Odocoileus hemionus*); Merriam's turkey (*Melagris gallopavo merriami*), which was transplanted successfully in the area by the Arizona Game and Fish Department; and numerous species of small mammals and birds, among other things.

Several special status species are known to occur, or could possibly occur in the Shivwits region of the recreation area. Federally threatened bald eagles occur rarely on the Arizona Strip during the winter. Peregrine falcons have been found on the Arizona Strip and may inhabit the Shivwits area year-round, utilizing the steep cliffs adjacent to Lake Mead NRA. There is suitable Mexican spotted owl habitat within the Shivwits region, though no spotted owls were recorded during 2002 and 2003 surveys. Northern goshawks have been recorded in the park. California condors have been known to fly over the area and could roost within the Shivwits region.

The rare Grand Canyon rose (*Rosa stellata*) is known to occur near Twin Point on the Shivwits Plateau. It grows in thin sandy-gravelly soils with limestone pebbles overlying Kaibab limestone bedrock in open Great Basin woodland vegetation. *Penstemon distans* is a sensitive plant species that occurs on the northeastern edge of the recreation area.

### Air Quality

Lake Mead NRA is designated as a Class II air quality area, and air quality in the region is generally good. Most reductions in air quality are due to air flows from the Las Vegas Valley west of Lake Mead NRA. The adjacent Grand Canyon NP is designated a Class I airshed.

### Soundscapes

The natural soundscape is defined as the natural sound conditions in a park which exist in the absence of any human-produced noises. It is the aggregate of all the natural sounds that occur in parks, together with the physical capacity for transmitting natural sounds. Natural sounds within the park are produced by wildlife, and geomorphic processes such as water and wind acting on vegetation, rocks or other landform features. Natural sounds occur both within and beyond the range of sounds that humans can perceive, and can be transmitted through air, water, or solid materials. The natural soundscape is a park

resource having inherent value, as well as having properties that may be enjoyed by people. The natural soundscape is part of the wilderness setting and character. In accordance with policy derived from basic NPS mandates, the NPS is to preserve the natural soundscapes of parks and protect them from degradation due to noise, and to restore degraded soundscapes to the natural condition wherever possible.

Undesirable noise can adversely affect the natural soundscape. Existing sources of noise include motorized watercraft, vehicle noise from roads and highways, and aircraft overflights. Within most wilderness components of the park, aircraft noise is the dominant source. A detailed discussion of wilderness areas currently impacted by noise is provided in the “Wilderness” section.

## **CULTURAL RESOURCES**

### Historic Overview: Prehistory

Archeologists have identified a series of Native American cultures that have occupied Lake Mead NRA and adjacent areas in southern Nevada and Western Arizona over the last 12,000 to 13,000 years. These cultures have been divided into discrete time periods based on various criteria, including changes in technology, the types of animal and plant foods used, or the migration of peoples into and out of the area.

Occupation of the area began at the end of the late Pleistocene around 12,000 to 13,000 years ago with the Paleoindian period. The Paleoindian period lasted into the Holocene and ended around 7,000 before present (BP). The Pleistocene was dominated by greater rainfall and moderate temperatures, which created an environment of vast lakes and humid conditions. During the Paleoindian period of the early Holocene, the environment was characterized by a general trend to warmer and dryer conditions. Paleoindian peoples lived in small, highly nomadic groups, utilized wild plant foods, and hunted now extinct big game. Physical remains from the Paleoindian period usually consist of flaked stone tools and the by-products of tool manufacture, e.g. flakes and spent cores.

The Archaic period (7,000 to 2,000 BP) is characterized by nomadic peoples living in small groups adapted to the mosaic of microenvironments created by the overall warmer and dryer conditions. Their subsistence was based on gathering wild plant foods and hunting small game. Flaked stone tools and the by-products of tool manufacture, along with the common occurrence of ground stone artifacts, typify the Archaic period.

The arrival of Anasazi peoples from the east marked the end of the Archaic period and the beginning of the Saratoga Springs period. The Saratoga Springs period (2,000 to 750 BP) was dominated by the expansion of the Virgin Anasazi into the Lake Mead area, and their eventual withdrawal. The Virgin Anasazi were Puebloan peoples who used pottery and lived in permanent structures. They practiced some horticulture but still depended heavily on wild plant and animal foods.

The Late Prehistoric lifeway, which began around 750 BP, was similar to Archaic adaptations. The people lived in small mobile groups, gathered wild plant foods, and hunted small game. They also practiced small scale horticulture. Archeologically, these

people are indistinguishable from the Mojave, Quechan, Hualapai, and Havasupai (Yuman-speaking peoples) and the Southern Paiute (Numic-speaking peoples) who occupied the area during the Historic period.

#### Euro-American History

The Spanish and later the Mexicans were the first whites to explore the area. During the Spanish/Mexican period (1500s to 1840s) trade routes were established between the population centers in New Mexico and the colonies in California. These trade routes included the Mojave Trail and the Old Spanish Trail, which passed through Southern Nevada.

The Mormons were the first to establish permanent white settlements in Southern Nevada. These included Las Vegas, St. Thomas, and Callville, the latter two of which were inundated by Lake Mead. During the late 1800s and early 1900s, the prosperity of these communities and others in the area was determined by the boom and bust cycles of the mining and ranching industries that formed the economic base of the area.

The construction of Hoover Dam in the 1930s dramatically changed the landscape of southern Nevada and Western Arizona. It brought thousands of people to the area, put Las Vegas on the map, and helped develop the area's current economy based on recreation and tourism.

#### The Shivwits Plateau

Less than two percent of the Shivwits area has been systematically surveyed for cultural resources. The Shivwits Plateau has been inhabited since prehistoric times. It is for this reason numerous archeological resources exist here. Historic ranching activities on the plateau combine to create an excellent example of a vernacular cultural landscape. The landscape includes Horse Valley Ranch (Waring Ranch), listed on the National Register of Historic Places, along with various barns, mills, corrals, fences, tanks and roads all of which are included on Lake Mead NRA's List of Classified Structures.

### **SOCIOECONOMIC RESOURCES, VISITOR USE, AND PARK OPERATIONS**

Tourism is an important component of the region surrounding Lake Mead NRA and Grand Canyon-Parashant NM, and much of the tourism revolves around the gaming industry. The recreation area provides a valuable resource to the area, contributing to the local economy through the sale and rental of boats and other water-related equipment, and other recreational equipment and services. It is estimated that the total annual impact of the recreation area on the gateway communities in the region is in the millions of dollars.

Hunting, in accordance with state law, is authorized within the recreation area and national monument. Bighorn hunting season within Lake Mead NRA is co-managed by NDOW and the NPS in Nevada, and AGFD and the NPS in Arizona. Limited numbers of tags are issued each year for desert bighorn sheep within the recreation area. The number of tags is based on herd population data and habitat conditions. Mule deer hunting occurs on the Shivwits Plateau on park lands.

## **WILDERNESS UNITS**

Wilderness within and adjacent to Lake Mead NRA and Grand Canyon-Parashant NM offers visitors unique opportunities for seeking solitude and quiet in remote and isolated desert areas. Visitation within wilderness areas is limited mostly to day hiking, primarily in the season extending from November through mid-March. Characteristically, most hiking occurs on the weekends. Approximately 10 to 20 hikes per week, consisting of 2 to 4 people are typical during the winter months.

Portions of the proposed aerial operations would take place in designated, suitable, or potential wilderness (Figures 4 and 5). Listed below is a description of each wilderness area in which potential aerials operations may occur.

The existing and proposed wilderness boundary lines of the units follow topographic features, access roads, rights-of-way corridors, the recreation area boundary line, section lines, and a line marking a 300-foot setback from the high-water lines of Lakes Mead and Mohave. Acreages are general estimates and have not been validated.

### Eldorado Wilderness (Designated)

Contained within this 26,252-acre unit are the picturesque and rugged Eldorado Mountains. The unit is a maze of peaks and side canyons with vertical cliffs extending to the edge of the Colorado River. The Eldorado Landing access road forms the southern boundary; the Colorado River/Lake Mohave 300-foot setback constitutes the east boundary, the northeast side is bounded by the Mead-Liberty Transmission Line, and the recreation area boundary forms the west unit boundary. The primary noise sources in this wilderness include motorized watercraft from Lake Mohave and occasional vehicle noise from the adjacent approved roads.

### Spirit Mountain Wilderness (Designated)

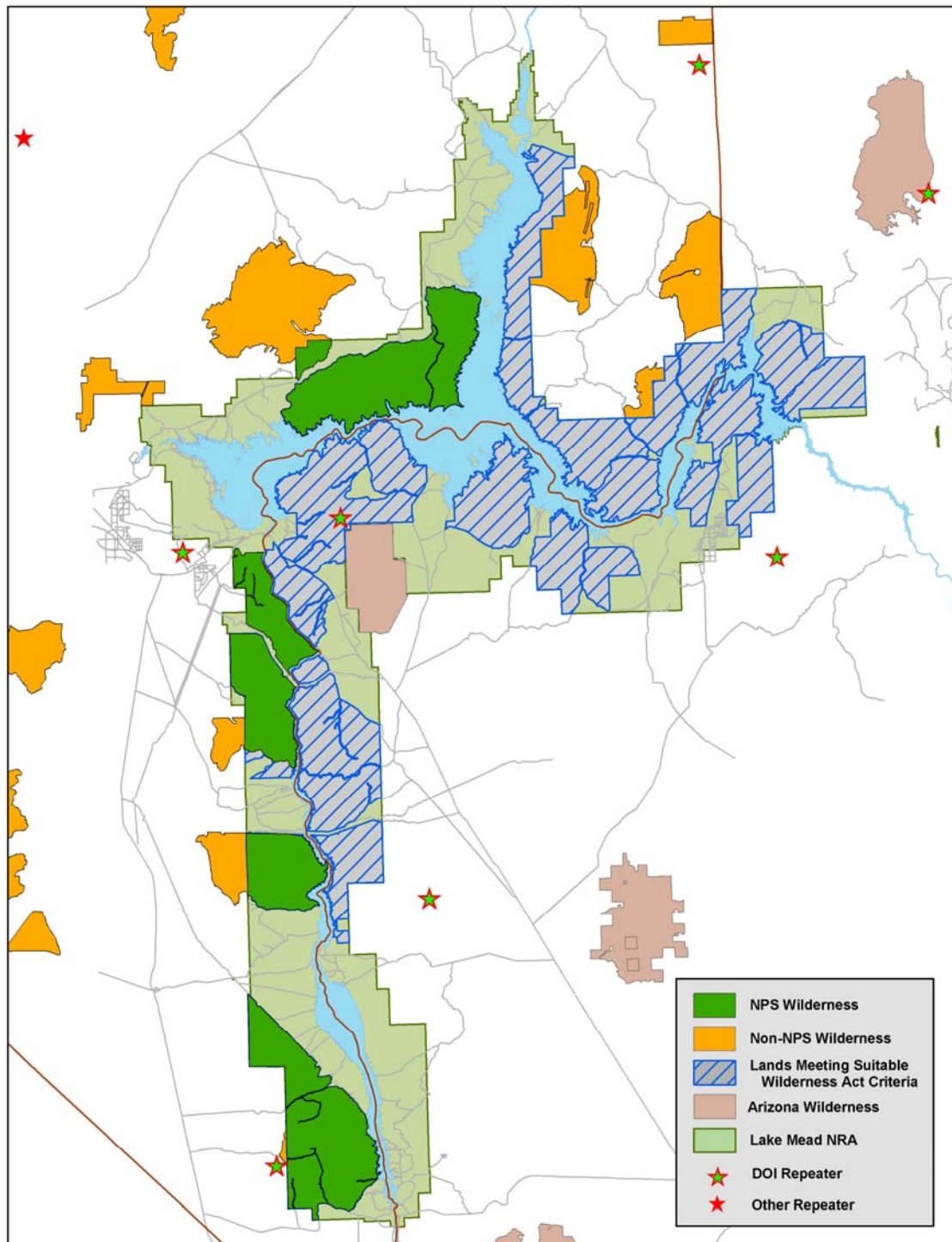
This 33,518-acre unit is located in the Newberry Mountains. The area contains huge granite boulders, outcrops, and the build of Spirit Mountain. Numerous archeological resources occur in the area. The Spirit Mountain complex is part of a designated traditional cultural property. Bighorn sheep, bobcats, and coyotes inhabit the area. Reptiles found in the area include Western chuckwalla, side-blotched lizard, Gila monster, and rattlesnakes. The area contains important desert tortoise habitat. The primary noise sources in this wilderness include motorized watercraft from Lake Mohave and occasional vehicle noise from the adjacent approved roads.

### Muddy Mountains Wilderness (Designated)

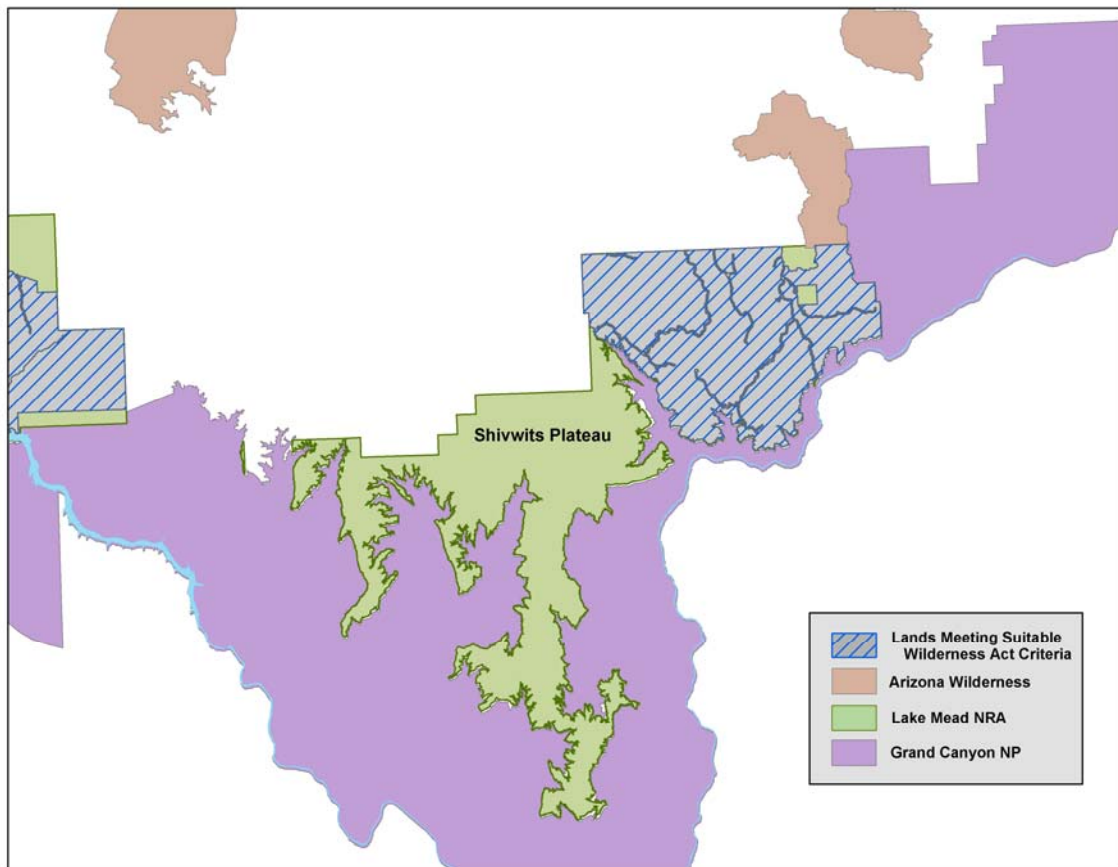
This unit consists of 3,521 acres of NPS administered lands, and 44,498 acres of BLM administered lands, totaling 48,019 acres. The Muddy Mountains region offers shadowy slot canyons, mind-bending geological formations and expansive views of Lake Mead. Solitude and silence are as common as the narrow canyons and gravelly washes. The landscape here displays a thriving Mojave Desert habitat of creosote bush, black brush, yucca, Joshua trees and desert willow. Desert bighorn sheep, banded Gila monster and the desert tortoise inhabit the area. The primary noise source in this wilderness unit is from air tour operations, including helicopter tours over the Bowl of Fire.



Figure 4. Designated, suitable and potential wilderness in the Lake Mead region



**Figure 5. Proposed and Potential Wilderness, Lake Mead NRA Portion of Grand Canyon- Parashant NM**



#### Black Canyon Wilderness (Designated)

This 17,220-acre wilderness unit is contained within the picturesque and rugged Eldorado Mountains. The area is a maze of peaks and side canyons with vertical cliffs extending to the edge of the Colorado River. Much of the terrain was formed by volcanism. A 230-kV powerline corridor separates this unit from the Eldorado unit. The area contains scenic beauty and some remnants of past mining. Water is scarce in the unit and the summer temperatures can reach 120+ degrees. Archeological resources are found in the area including petroglyphs, lithic scatters, and an intaglio. Bighorn sheep, bobcats, mountain lion, coyotes, and jackrabbits inhabit the area. Reptiles found in the area include side-blotched lizard, rattlesnakes, and desert tortoise. The noise sources that affect this wilderness unit are air tours and motorized vessels on the northern reaches of Lake Mohave.

#### Bridge Canyon Wilderness (Designated)

This unit consist of 7,761 acres in the Newberry Mountains, which rise to an elevation of 5,600 feet and offer a cool refuge from the heat of the surrounding desert lowlands. Rugged granite boulders and steep canyons are found through most of the unit. Springs and seeps offer water to wildlife in the area. The area contains huge granite boulders, outcrops, and caves, making this area very scenic. Stands of cottonwood trees can be found along the Grapevine Wash and Sacatone Wash water courses. Numerous archeological resources occur in the area. An outstanding example of petroglyphs are found in Grapevine Canyon. Bighorn sheep, bobcats, and coyotes inhabit the area. Reptiles found in the area include Western chuckwalla, side-blotched lizard, Gila monster, and rattlesnakes. The area contains important desert tortoise habitat. The primary noise sources in this wilderness include motorized watercraft from Lake Mohave and occasional vehicle noise from the adjacent approved roads.

#### Pinto Valley Wilderness (Designated)

This unit is comprised of approximately 39,175 acres of rugged hills and highly scenic valleys. These units contain Guardian Peak, which is one of the highest peaks within the area. The northern side of Boulder Canyon is formed by these units, where steep cliffs or barren rock enter the waters of Lake Mead in a dramatic fashion. Pinto Valley is formed within these units and exemplifies a much photographed topography due to the red sandstone at outcroppings which merge with the green desert vegetation and the grays, browns, and yellows of the desert floor. This area has known populations of the rare Las Vegas bearpoppy. The primary noise sources in this wilderness include motorized watercraft from Lake Mead, vehicle noise from Northshore road in the portion of the wilderness adjacent to the road, and noise from air tour operations.

#### Jimbilnan Wilderness (Designated)

This 18,880-acre unit is bounded on the north by the Echo Wash Access Road, on the east by the 300-foot setback from the high water line of Lake Mead, on the south by an access road, and on the west by Northshore Road and the Boathouse Cove access road. Mountainous terrain representing the northeast extremities of the Black Mountains dominates the area and contrasts directly with the flat surface of Lake Mead. The sand dunes in this area are known habitat for two rare plants, the Beaver Dam milkvetch and

the sticky buckwheat. The primary noise sources in this wilderness include motorized watercraft from Lake Mead, occasional vehicle noise from the adjacent approved road, and noise from air tour operations.

#### Nellis Wash Wilderness (Designated)

This 16,424-acre unit includes portions of the isolated Newberry Mountains along the western side of the recreation area. Fingerlike drainages and alluvial fans extend eastward from the mountains toward Lake Mohave. Some mining has occurred within the unit, as is the case in many areas of the recreation area. However, it is not obtrusive and in effect adds an historic element that is characteristic of the historic west. No active mining occurs within the unit. No water is found in the unit and the summer temperatures can reach 120 degrees. Coyotes, and jackrabbits inhabit the area. Reptiles found in the area include, side-blotched lizard, rattlesnakes, and desert tortoise. The primary noise source in this wilderness unit is occasional vehicle noise from the adjacent approved road.

#### Ireteba Peaks Wilderness (Designated)

Within this 22,300-acre wilderness area is a portion of the Eldorado Mountains, gently rolling hills and washes extending to Lake Mohave. Rugged mountains, secluded valleys, and flat alluvial fans provide opportunities for seclusion and isolation in a setting of scenic splendor. Teddy bear cholla forests, federally designated threatened desert tortoises, and Townsend's western big-eared bats are just some of the unique species present in this unit. This unit contains one of the few populations of the rare rosy two-toned beardtongue located within the recreation area. The primary noise sources in this wilderness include motorized watercraft from Lake Mohave and occasional vehicle noise from adjacent approved roads.

#### Fire Mountain (Proposed and Proposed Potential)

These units contain 53,250 acres of the most spectacular and rugged terrain within the recreation area. They consist of steep barren rocky crags, which begin at an elevation of 645 feet and terminate at an elevation of approximately 2,200 feet. Significant features of these units include the dramatic Fire Mountain, which rises severely from the desert floor, along with sand dunes, deep canyons, large alluvial fans, important desert bighorn sheep habitat, peregrine falcon habitat, and the northern most stand of native palo verde trees in the nation. The primary noise sources in this wilderness include motorized watercraft from Lake Mohave and occasional vehicle noise from adjacent approved roads.

#### Kingman Wash (Proposed)

Approximately 35,530 acres are included within this unit. It is bordered on the north by the 300-foot horizontal setback from the high-water line of Lake Mead, on the west by the Kingman Wash area and access road, on the south by U.S. 93 and the Mt. Wilson Wilderness Area managed by the Bureau of Land Management, and on the east by access roads. An area used for intensive recreation and an area which may be needed as a powerline corridor are identified as non-wilderness along the east boundary. The undulating Black Mountains typify the topography of the region. This area provides

important habitat for desert bighorn sheep. Access to the unit is provided on all sides by existing road corridors. The primary noise sources in this wilderness include motorized watercraft from Lake Mead, occasional vehicle noise from the adjacent approved road, and noise from air tour operations.

#### Bonelli Landing (Proposed)

This unit comprises 13,875 acres of mainly alluvial fans and separates the hilly mountainous area of unit 13 from the gypsum beds of unit 21. This unit contains some historic mining diggings and some archeological remains in the form of petroglyphs. Access to this unit is primarily by the road to Bonelli Landing and to Temple Bar. The primary noise sources in this wilderness include motorized watercraft from Lake Mead, occasional vehicle noise from the adjacent approved road, and noise from air tour operations.

#### Overton (Proposed)

Most of this 24,040-acre unit consists of flat to “badland-like” lands sloping westward from mountainous terrain to a road corridor east of the recreation area boundary. The unit forms the scenic background for lake users, and for shoreline users on the west side of Overton Arm. These flat washes lack the spectacular contrasts found within other units. This unit has a typical desert landscape. It has retained its primitive condition, and affords an opportunity for seclusion and an unconfined type of recreation. This area contains populations of the rare Las Vegas bearpoppy. On the north, the unit is bordered by the Fisherman’s Landing access road on the east by the recreation area boundary, on the south by the Catclaw Access Road, and on the west by the 300-foot setback from Lake Mead. The primary noise sources in this wilderness include motorized watercraft from Lake Mead and occasional vehicle noise from the adjacent approved road.

#### Cottonwood Valley (Proposed Potential)

Cottonwood Valley potentially meets the criteria of the Wilderness Act because of the presence of mineral reservations. This outwash trending to the west provides solitude and isolation in a primitive setting north of a major development at Katherine Landing. This 15,295-acre unit is bounded on the north, south, and west by existing access roads, and on the east by the recreation area boundary. The terrain slopes gently westward toward Lake Mohave. The primary noise sources in this wilderness include motorized watercraft from Lake Mead and occasional vehicle noise from the adjacent approved road.

#### Black Mountains (Proposed)

The Black Mountains, capped by 2,000-foot Mount Davis, provide the background to users of Lake Mohave. Approximately 17,970 acres are included within this proposed wilderness unit, and 640 acres is proposed potential wilderness due to mineral reservations. Scattered washes and side canyons transect the Black Mountains from east to west as they wind their way to the Colorado River. The Four Corners-Eldorado Transmission Line forms the north boundary, the west boundary is 300 feet from the high-water line of Lake Mohave, the south boundary follows a series of roads of the Cottonwood Valley system, and the east boundary is the recreation area boundary line.

The primary noise sources in this wilderness include motorized watercraft from Lake Mead and occasional vehicle noise from the adjacent approved roads.

Arizona Strip (Proposed) (A portion of these units are in Grand Canyon-Parashant National Monument)

These units are known as Twin Springs, Scanlon Wash, Hiller Mountains, Hell's Kitchen, Indian Hills, Cockscomb, Grand Wash Cliffs, Iceberg Ridge, South Cove, and Pearce Ferry. The units contain rugged mountain ranges which provide a scenic background for the Virgin Basin of Lake Mead. Gently sloping outwash fans extend from the mountain fronts to plunge abruptly into the reservoir.

The units are bounded by a network of roads that provide access to developed areas or the lakeshore, by recreation area boundaries, and the lakeshore setback. The interior portions of these wilderness units are readily accessible from adjacent roads. Units 13 through 22 contain a total of approximately 138,755 acres. The primary noise sources in this wilderness include motorized watercraft from Lake Mead, occasional vehicle noise from the adjacent approved road, and noise from air tour operations.

White Hills, Temple Bar, and Gregg's Hideout (Proposed)

These proposed wilderness units are located within the White Hills. This rolling hill country includes some evidence of earlier historic mining activities and trails associated with these efforts. The early methods of mining did not scar the area excessively and many scars have healed to the point of not being noticeable. However, areas further to the west are not proposed as wilderness because they have been severely scarred by modern exploration techniques and road construction. Isolation, seclusion, scenic views and historic significance characterize the proposed wilderness. Unit 21, with unique gypsum soils, contains significant populations of the rare Las Vegas bearpoppy.

Unit boundaries consist of access roads, setbacks from Lake Mead, development areas and recreation area property lines. Access to the area is possible from existing roads, hiking from developed areas such as Temple Bar, or by boat from Lake Mead. These three units contain a total of approximately 52,130 acres. The primary noise sources in this wilderness include motorized watercraft from Lake Mead, occasional vehicle noise from the adjacent approved road, and noise from air tour operations.

Shivwits Plateau - Proposed Potential (Grand Canyon-Parashant NM)

Approximately 83,980 acres are included within this unit. A diversity of activities occurs in this remote section of Lake Mead, ranging from hunting to grazing. Due to a higher altitude, the region is cooler, has more precipitation, and supports pinyon/juniper and ponderosa pine forests. Therefore, it also contains a wider variety of wildlife, including mule deer. The sole population of Grand Canyon rose known to exist within the recreation area is located in this unit.

Hunting is a popular recreational pursuit, accounting for a large proportion of the visitation to the area. Additional recreational activities include nature study, camping, exploring with four-wheel drive vehicles, and hiking the superlative rim country. Kelly

Point, Twin Point, and other points along the rim permit spectacular views of the Grand Canyon.

Unit boundaries follow rims, internal access roads, and recreation area boundaries. Several of the units may appear to be narrow and splintered by access roads. However, when considered along with the adjacent proposed wilderness in Grand Canyon NP, it is apparent that these would form a significant contiguous wilderness unit. The primary noise sources in this wilderness include occasional vehicle noise from the adjacent approved road and noise from air tour operations.

Andrus Point, Unit 35 - Whitmore Point, and Unit 36 - Lava (Grand Canyon-Parashant NM)

These three proposed wilderness units consist of approximately 58,430 acres in the northeast sector of the recreation area. Contained within these units are Parashant, Andrus, and Whitmore Canyons; all are precipitous side canyons of significant grandeur that drain into the Grand Canyon. The entire area is undeveloped land retaining its primeval character with the imprint of humans largely unnoticeable; it provides an opportunity for solitude and a primitive and unconfined type of recreation within a scenic setting of steep escarpments, colorful redwalls, and deep canyons. Hunting is a popular recreational pursuit.

Geologic formations and processes in evidence here may provide information on the origin of the Grand Canyon, which is of interest to the scientific and educational communities. Also of interest to these communities are the archeological sites of several Indian cultures, including the Virgin Anasazi and more recently the Paiutes.

Grazing has occurred in this region for over a hundred years and the Lake Mead NRA enabling legislation and Grand Canyon-Parashant NM proclamation identifies grazing as an acceptable use. Roads and tanks or water pockets that are necessary for current grazing operations were excluded from the wilderness proposal. The primary noise sources in this wilderness include occasional vehicle noise from the adjacent approved roads and noise from air tour operations.

---

## **SECTION IV: ENVIRONMENTAL CONSEQUENCES**

---

### **INTRODUCTION**

This section presents the likely beneficial and adverse effects to the natural and human environment that would result from implementing the alternatives under consideration. This section describes short-term and long-term effects, direct and indirect effects, cumulative effects, and the potential for each alternative to impair park resources. Interpretation of impacts in terms of their duration, intensity (or magnitude), and context (local, regional, or national effects) is provided where possible.

The impact topics detailed for discussion relate primarily to the wilderness resources within the recreation area, and how the two alternatives would impact those resources. Wilderness resources of consideration include wildlife, wildlife habitat, sensitive species, the natural soundscape, visual resources, visitor use and experience, wilderness, safety, and park operations.

### **METHODOLOGY**

This section contains the environmental impacts, including direct and indirect effects and their significance to the alternatives. It also assumes that the mitigation identified in the *Mitigation and Monitoring* section of this EA would be implemented under the action alternative.

Impact analyses and conclusions are based on NPS staff knowledge of resources and the project area, review of existing literature, and information provided by experts in the NPS or other agencies. Any impacts described in this section are based on preliminary design of the alternatives under consideration. Effects are quantified where possible; in the absence of quantitative data, best professional judgment prevailed.

### **CRITERIA AND THRESHOLDS FOR IMPACT ANALYSES**

The following are laws, regulations, and/ or guidance that relates to the evaluation of each impact topic.

#### **Wildlife, Wildlife Habitat, and Sensitive Species**

Laws, Regulations, and Policies. The NPS Organic Act, which directs parks to conserve wildlife unimpaired for future generations, is interpreted by the NPS to mean native animal life should be protected and perpetuated as part of the recreation area's natural ecosystem. Natural processes are relied on to control populations of native species to the greatest extent possible. The restoration of native species is a high priority. Management goals for wildlife include maintaining components and processes of naturally evolving park ecosystems, including natural abundance, diversity, and ecological integrity of plants and animals.

The recreation area also manages and monitors wildlife cooperatively with the Arizona Game and Fish Department and the Nevada Department of Wildlife.



Impact Indicators, Criteria, and Methodology. The impacts of wildlife were evaluated in terms of impacts to individual animals and wildlife habitat. Specific localized impacts were estimated based on knowledge garnered from similar past activities.

The following are standards used by the NPS in interpreting the level of impact to wildlife:

- *Negligible impacts:* No species of concern is present; no impacts or impacts with only temporary effects are expected.
- *Minor impacts:* Nonbreeding animals of concern are present, but only in low numbers. Habitat is not critical for survival; other habitat is available nearby. Occasional flight responses by wildlife are expected, but without interference with feeding, reproduction, or other activities necessary for survival.
- *Moderate impacts:* Breeding animals of concern are present; animals are present during particularly vulnerable life-stages, such as migration or winter; mortality or interference with activities necessary for survival expected on an occasional basis, but not expected to threaten the continued existence of the species in the park.
- *Major impacts:* Breeding animals are present in relatively high numbers, and/or wildlife is present during particularly vulnerable life stages. Habitat targeted by actions has a history of use by wildlife during critical periods, but there is suitable habitat for use nearby. Few incidents of mortality could occur, but the continued survival of the species is not at risk.
- *Impairment:* The impact would contribute substantially to the deterioration of natural resources to the extent that the park's wildlife and habitat would no longer function as a natural system. Wildlife and its habitat would be affected over the long-term to the point that the park's purpose (Enabling Legislation, *General Management Plan*, *Strategic Plan*) could not be fulfilled and resource could not be experienced and enjoyed by future generations.

In the absence of quantitative data concerning the full extent of actions under a proposed alternative, best professional judgment prevailed.

## **Soundscapes**

Laws, Regulations, and Policies. NPS *Management Policies* (Section 4.9) requires the managing agency to preserve, to the greatest extent possible, the natural soundscapes of the park. Natural soundscapes exist in the absence of human-caused sound. The natural soundscape is the aggregate of all the natural sounds that occur in parks, together with the physical capacity for transmitting natural sounds. NPS *Management Policies* directs superintendents to identify what levels of human-caused sound can be accepted within the management purposes of the parks.

*Director's Order 47: Soundscape Preservation and Noise Management* defines appropriate and inappropriate noise. The overall goal of NPS units, as defined in the order, is the protection, maintenance, or restoration of the natural soundscape resource. However, it does state that some sound producing activities, including resource management activities, may be appropriate if they are included in the park's purpose as defined by its enabling legislation.

Impact Indicators, Criteria, and Methodology. The methodology used to assess noise impacts from management-related aerial operations in this document is consistent with the methodology being developed for NPS Reference Manual 47, *Soundscape Preservation and Noise Management*, in accordance with 2001 NPS *Management Policies* and NPS *Director's Order 47*. Context, time, and intensity interact in a complex manner that determines the level of noise impact for an activity. For example, a certain amount of time and intensity would be a greater impact in a highly sensitive context, and a given intensity would be a greater impact if it occurred more often or for a longer duration. It is usually necessary to evaluate all three factors together to determine the level of noise impact. In some cases, analysis of one or more factors may indicate one impact level, while analysis of another factor indicates a different impact level according to the criteria below. In such cases, management judgment based upon a documented rationale must be used to determine which impact level best applies to the situation being evaluated.

Park-specific factors related to context, time, and intensity are discussed below and then integrated into a discussion of the impact thresholds used in this analysis.

*Context* — The recreation area and national monument resources most likely to be affected by noise, including management-related aerial operations, include wilderness areas, the park's natural soundscape, cultural properties (e.g., sacred sites), noise-sensitive wildlife, and wilderness visitors. Visitor experiences most likely to be affected by management-related aerial operations include the opportunities to experience solitude and the park's natural soundscape unaffected by human noise.

As discussed previously, existing background noise levels within the wilderness areas at Lake Mead NRA are influenced by boats, automobile and truck traffic, high level commercial and military aircraft, and air tour operations (helicopters and airplanes). While specific background noise studies are not available for Lake Mead NRA, given its setting, it is assumed that the soundscape ranges from active urban in the developed areas and high-use zones on the lakes to quiet rural in the outlying areas of the recreation area where use levels are considerably lower.

All motorized use, including helicopters and airplanes, produce noise that may impact park soundscapes and visitor experiences. Noise levels vary by lake and area. The most intense noise from aircraft occurs near the air tour routes and approaches to Las Vegas.

The most intense noise from motorized vessels occurs near the developed areas and high use areas of Lakes Mead and Mohave, with less noise occurring in the more isolated

portions of the lakes, including the sensitive inflow areas and those areas zoned as primitive and semiprimitive under the park's *Lake Management Plan* (2002). The most intense noise from vehicle use occurs near the paved roads of the recreation area, including Lakeshore Road, Northshore Road, US Highway 93, park access roads, and other paved roads, with less intense noise and visitor use on the parks approved road system, which are dirt or four-wheel drive only roads.

Because of its remoteness, there is very little background noise within the wilderness areas at Grand Canyon-Parashant NM. The dominant noise sources include automobiles, trucks, and air traffic.

For the purpose of this evaluation, noise impacts will be evaluated as they relate to specific project areas and the acreage adjacent to the project areas where noise impact could occur. The evaluation focuses on the more sensitive areas of the recreation area and national monument, including designated wilderness areas and those areas considered suitable for wilderness designation, and sensitive wildlife habitat.

*Time factors* — Motorized use, including aircraft use, occurs year-round within the recreation area. Management-related aerial operations, unless in emergency situations, are only permitted to operate during daylight hours. Time periods of greater sensitivity to noise impacts include sunset, sunrise, and nighttime when visitors are in camp and when wildlife may be more active.

In areas and times of concentrated motorized use, particularly on the lakes and near access roads, noise from motorized vessels and vehicles can be present virtually constantly from near sunrise to near sunset. In areas of low use, noise can be intermittent, usually lasting at least a few minutes when a vehicle, vessel, or aircraft is present.

For the purposes of this evaluation, short-term impacts are defined as those impacts that, as a result of the project, occur only for the duration of a time-finite project, or are a one-time event. Long-term impacts are those created by actions that are permitted for a term of more than a year, or allowed to continue programmatically and indefinitely.

*Intensity* — Existing natural ambient sound levels within the project area are expected to range from roughly 20 to 40 A-weighted decibels, which is low and comparable to acoustic data collected at Grand Canyon National Park, Glen Canyon NRA, Bryce Canyon National Park, and Zion National Park in areas with similar vegetation type, height, and density characterized mostly by wind in the vegetation and wildlife (especially insects and birds). The primary human factor affecting the natural soundscape is motorized watercraft, beach activities (including generators and music), aircraft, and automobile and truck traffic. Given this, the primary soundscape issue at Lake Mead NRA and Grand Canyon-Parashant NM is the effect of the noise generated by these sources as it affects the natural soundscape and as is perceived by visitors who use the recreation area for natural sounds, quiet, or solitude.

*Integrating context, time, and intensity.* To estimate the relative impacts of management-related aerial operations at the park, the following methodology was followed:

Context sensitivity was determined through an analysis of park purpose, significance, management objectives and zoning, park resources and values, and specific sites. Noise impacts from management-related aerial operations will focus on the most sensitive resource areas of the recreation area, including wilderness areas, and sensitive wildlife habitat. The primary wildlife habitat considered is bighorn sheep and mule deer habitat, peregrine falcon nesting areas, and bald eagle roosting areas.

Other considerations, such as topography, vegetation, prevailing winds, other noise sources, etc., were used to identify areas where aerial operations noise levels may be exacerbated or reduced.

After estimating the number of management-related aerial operations that would occur in each area during the proposed time periods, the range of relative noise generated by them, and the potential areas where noise concentrations and effects on park resources and visitors may be of concern, the following thresholds were used as indicators of the magnitude of impact for each of the management alternatives. The criteria will be applied on a site-specific basis to assess the level of impact.

- *Negligible impacts:* Sound created by the proposed aerial operations is not detectable for a significant portion of the project area or a significant amount of time. If human-caused noise is present at all, it is only at very low levels compared with the natural soundscape and only for short duration in most of the area. Natural sounds that are unique to the park are not interrupted for a significant length of time.

Visitors almost always have the opportunity to experience the natural soundscape free from human-caused noise, especially between sunset and sunrise.

- *Minor impacts:* Human-caused noise associated with the proposed activities is detectable in 10% of the project area for 10% of the time during which the sound is generated. Project-related noise is at low levels compared with the natural sounds and is only rarely audible. Natural sounds that are unique to the recreation area are interrupted less than 5% of the time. Human-caused noise is no more than occasionally audible between sunset and sunrise at 500 feet or more from the noise source.
- *Moderate impacts:* Human-caused noise associated with the proposed activities is detectable in 10% of the project area for 50% of the amount of time during which the sound is generated. Human-caused noise is occasionally audible between sunset and sunrise at 500 feet from the noise source. Natural sounds that are unique to the recreation area are interrupted less than 10% of the time.
- *Major impacts:* Sound created by the proposed activities is detectable in more than 10% of the project area for 50% of the amount of time during which the noise is

generated, or, natural sounds that are unique to the park are interrupted more than 10% of the time. Large areas may experience human-caused noise at moderate to high levels compared with the natural soundscape for a majority of each hour during a majority of the daylight hours. Human-caused noise is frequently audible between sunset and sunrise at 500 feet from the noise source.

Visitors have the opportunity to experience the natural soundscape free from human-caused noise less than a majority of the time in the majority of the project area.

- *Impairment* —Impairment is more likely when natural sounds are adversely and significantly affected. Few noise free intervals occur during hours of operation, and noise may be characterized as greatly in excess of natural sound levels. Impairment is more likely for long-term actions, and those having moderate to major impacts on the soundscape as defined.

The natural soundscape is impacted at greater than moderate levels the majority of the day or frequently at night. Adverse impacts to wildlife, visitor experience, or cultural values occur and are irreversible or irretrievable. The purpose and mission of the area in the park can not be fulfilled.

## **CRITERIA AND THRESHOLDS FOR IMPACT ANALYSES OF ALL OTHER ISSUES**

Impacts to visual resources, safety, recreation operations, visitor experience, and wilderness were analyzed using the best available information and best professional judgment of park staff.

Terms referring to impact intensity, context, and duration are used in the effects analysis. Unless otherwise stated, the standard definitions for these terms are as follows:

- *Negligible impacts*: The impact is at the lower level of detection; there would be no measurable change.
- *Minor impacts*: The impact is slight but detectable; there would be a small change.
- *Moderate impacts*: The impact is readily apparent; there would be a measurable change that could result in a small but permanent change.
- *Major impacts*: The impact is severe; there would be a highly noticeable, permanent measurable change.
- *Localized Impact*: The impact occurs in a specific site or area. When comparing changes to existing conditions, the impacts are detectable only in the localized area.

- *Short-Term Effect:* The effect occurs only during or immediately after implementation of the alternative.
- *Long-Term Effect:* The effect could occur for an extended period after implementation of the alternative. The effect could last several years or more and could be beneficial or adverse.
- *Direct Effect:* The effect is caused by the action and occurs at the same time and place.
- *Indirect Effect:* The effect is caused by the action and may occur later in time or be farther removed in distance but is still reasonably foreseeable.

## **IMPAIRMENT ANALYSIS**

Impairment to park resources and values are analyzed in this section. Impairment is an impact that, in the professional judgment of the responsible NPS manager, would harm the integrity of park resources or values, including the opportunities that otherwise would be present for the enjoyment of those resources or values. An impact would be more likely to constitute an impairment to the extent that it affects a resource or value whose conservation is key to the cultural or natural integrity of the park or is a resource or value needed to fulfill a specific purpose identified in the enabling legislation. An impact would be less likely to constitute an impairment if it is an unavoidable result that cannot be reasonably mitigated of an action necessary to preserve or restore the integrity of park resources or values.

A determination of impairment is made in the “Conclusion” section of all natural and cultural resource impact topics of this document. Impairment statements are not required for recreational values/visitor use and experience or safety-related topics.

### ***Cumulative Effects***

Cumulative effects are the direct and indirect effects of a proposed project alternative’s incremental impacts when they are added to other past, present, and reasonably foreseeable actions, regardless of who carries out the action (40 CFR Part 1508.7). Guidance for implementing NEPA (Public Law 91-190, 1970) requires that federal agencies identify the temporal and geographic boundaries within which they will evaluate potential cumulative effects of an action and the specific past, present, and reasonably foreseeable projects that will be analyzed. This includes potential actions within and outside the recreation area boundary. The geographical boundaries of analysis vary depending on the impact topic and potential effects. While this information may be inexact at this time, major sources of impacts have been assessed as accurately and completely as possible, using all available data.

The primary activities with the potential to cumulatively affect the resources related to the wilderness resource are the impacts from air tours over wilderness areas. The growth of the commercial air tour industry in the Las Vegas Valley area, and increases in area visitation are considered when analyzing the cumulative impacts of the proposed

alternatives. According to the air tour industry, there are more than 54,000 commercial air tours flying over Lake Mead NRA and Grand Canyon- Parashant NM per year. These flights cross over designated and suitable wilderness areas (Figure 6). Impacts for ongoing aerial operations outside the scope of this plan have the potential to add to the impacts of the proposed action.

Other activities considered for the cumulative effects discussion include other human-generated noise (motorized vessels on Lakes Mead and Mohave, other aircraft, vehicle noise, and NPS operational noise). Areas primarily affected by the use of motorized vessels on Lakes Mead and Mohave would be located adjacent to the urban, urban natural, and rural natural section as defined in the park's *Lake Management Plan* (2002) (Figure 7).

Commercial aircraft operate throughout the recreation at high altitudes, or lower altitudes if they are on their approach to McCarran International Airport in Las Vegas, or the Bullhead City Airport south of Katherine Landing. There are several flight paths utilized including north and southbound over the Overton Arm, the Muddy Mountains and Gold Butte areas east and westbound, and Lake Mohave north and southbound. There are many airports and airstrips in the region around Lake Mead NRA and Grand Canyon-Parashant NM (Figure 8).

Figure 6. Air Tour Routes

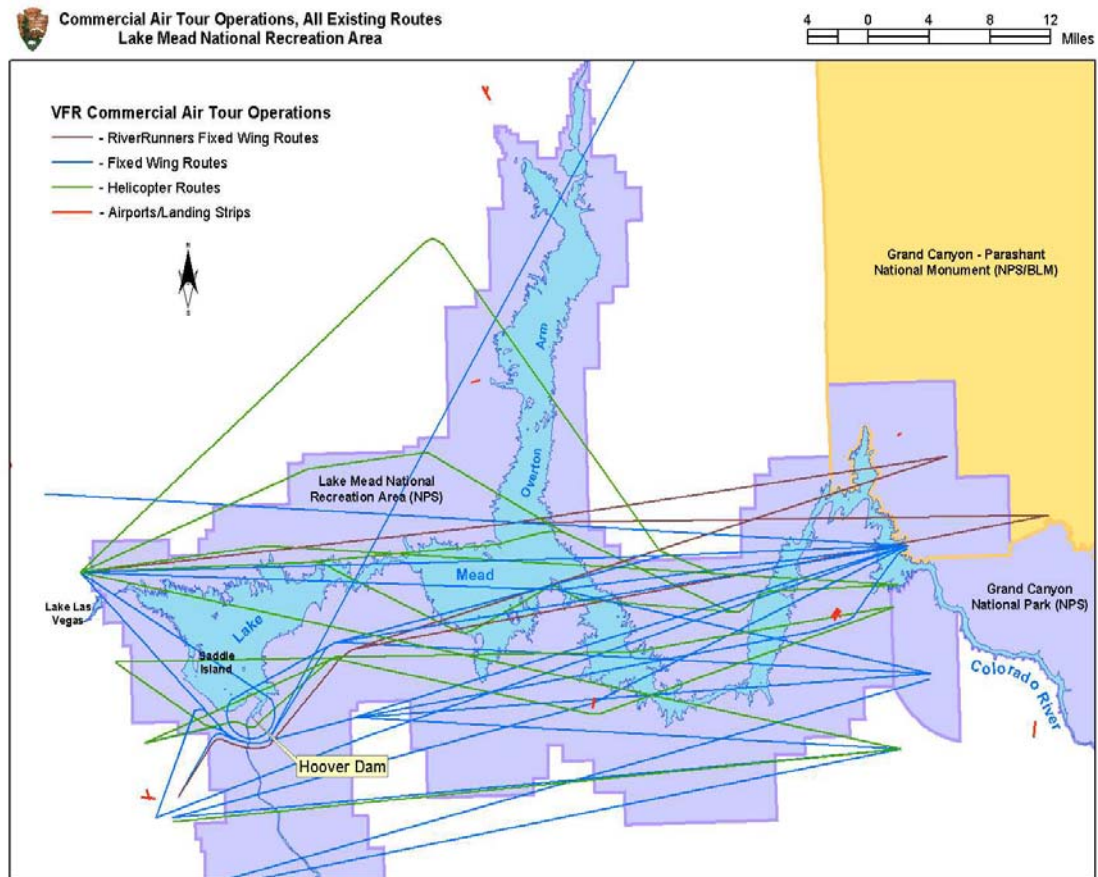




Figure 7. Lake Management Zoning

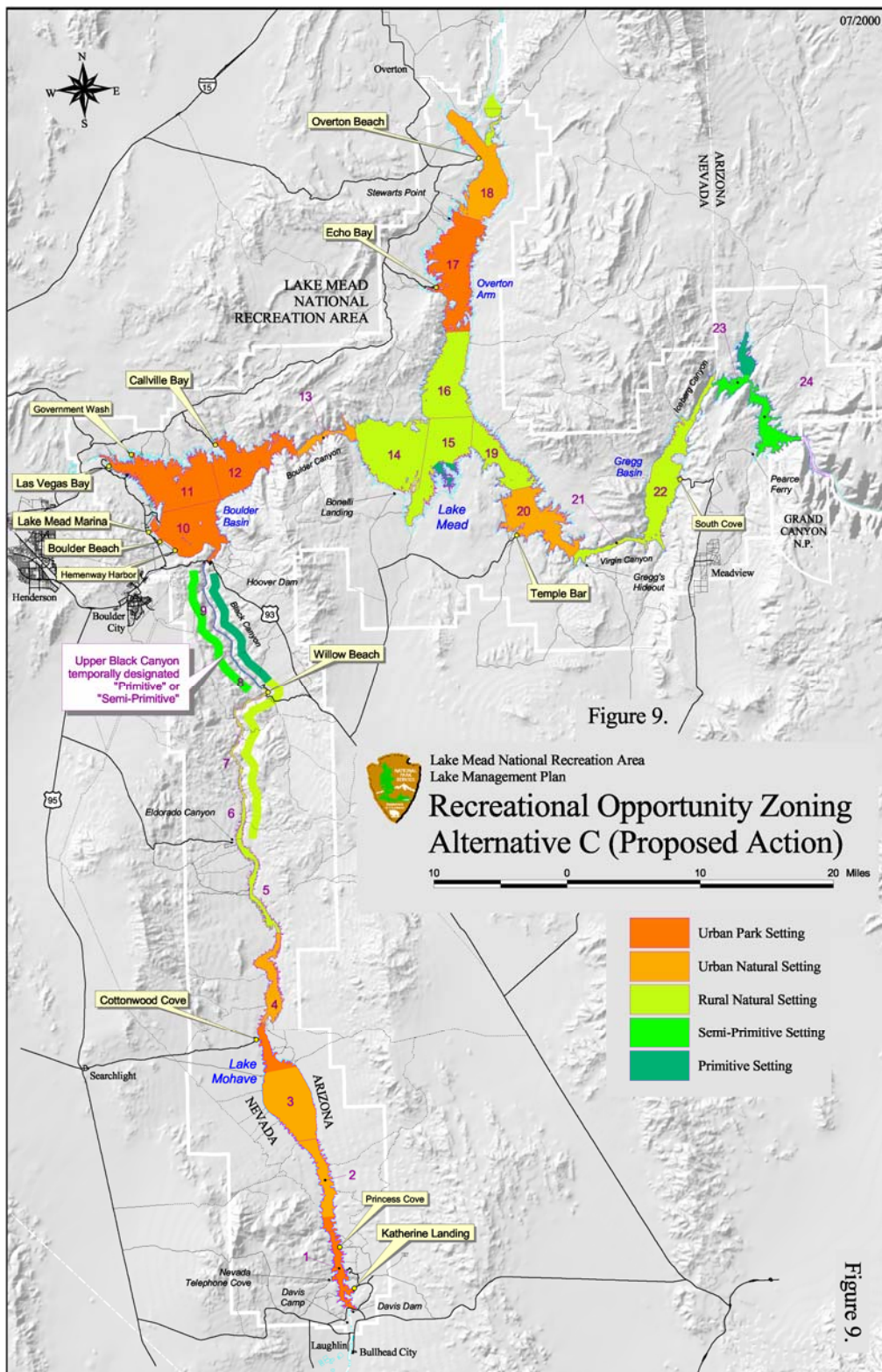
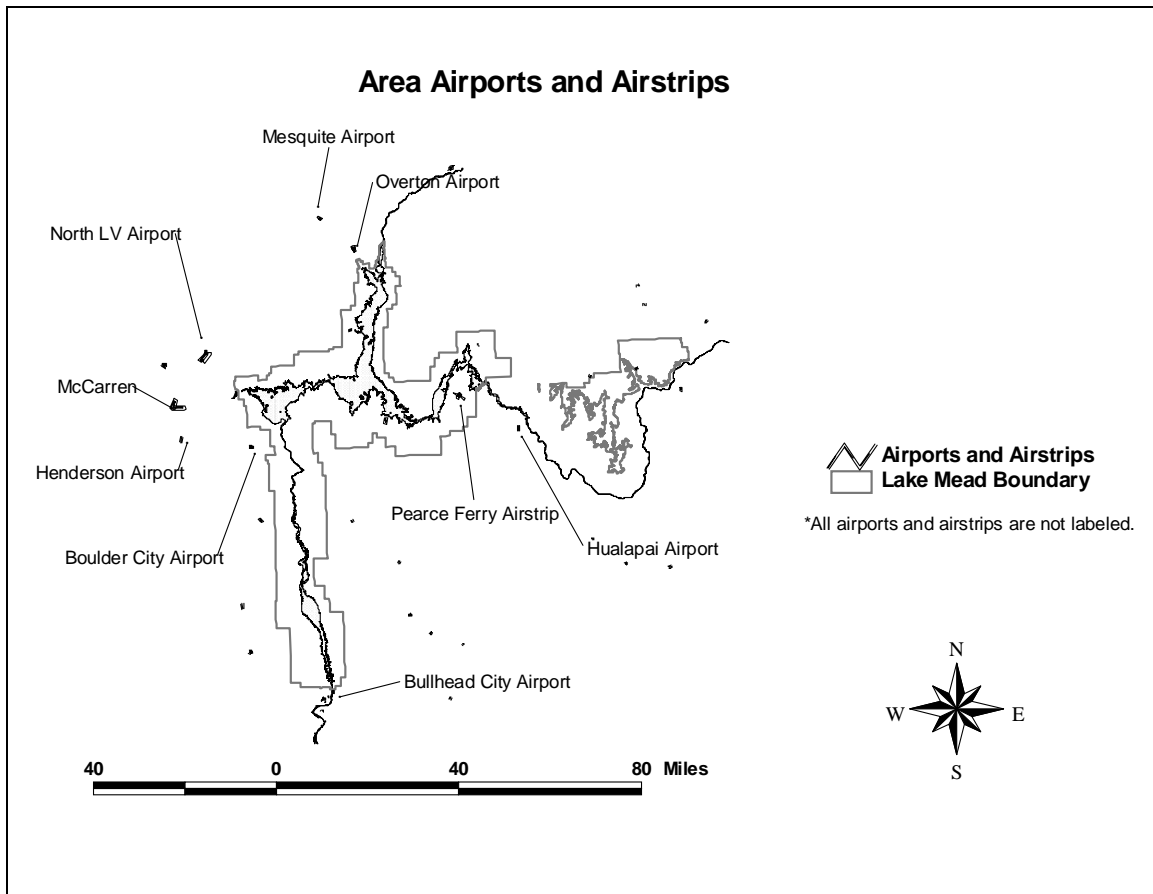


Figure 8. Area Airports and Airstrips

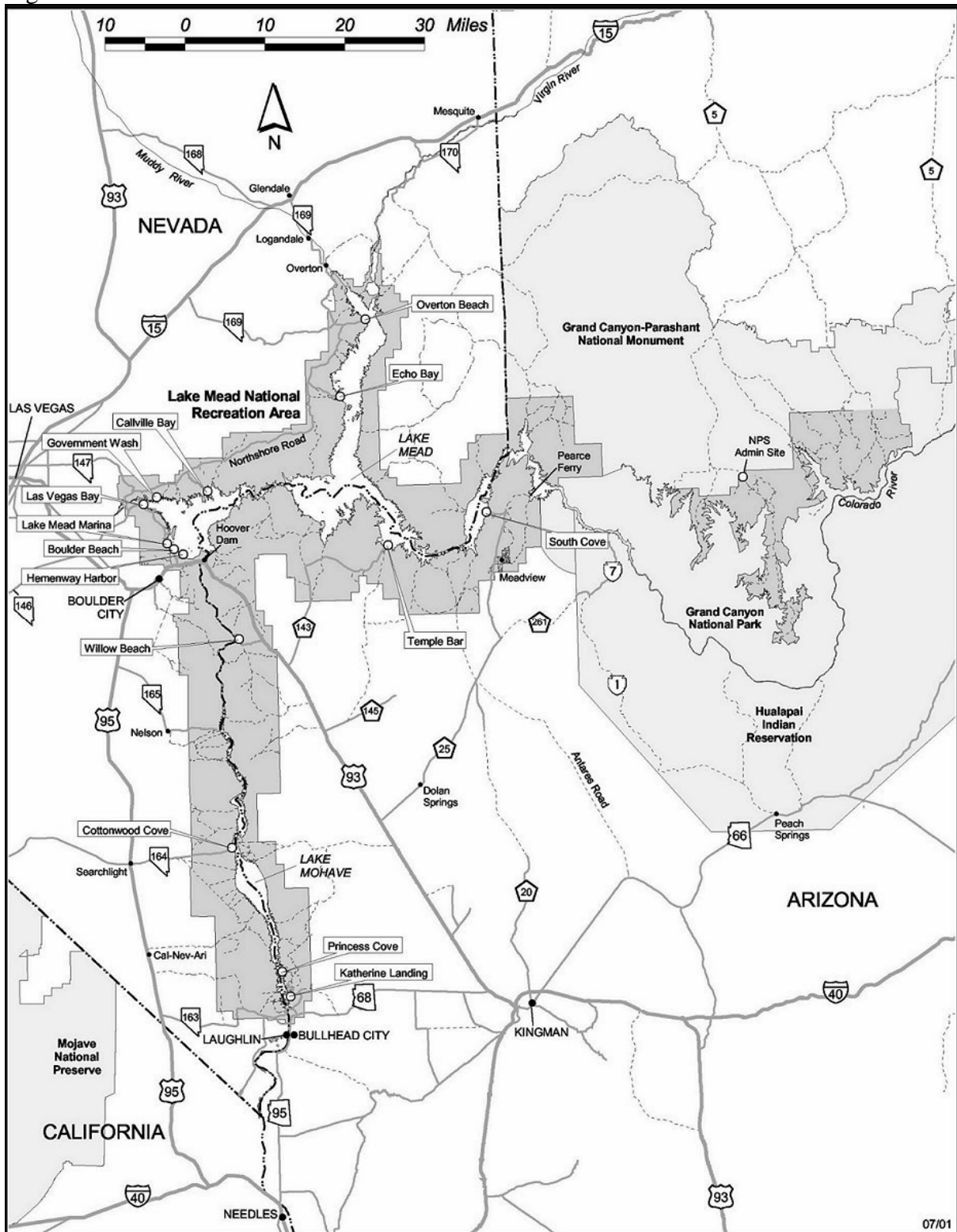


Noise from vehicles is audible on and around roads, with the most noise generated from cars and trucks on the busier highways in the park, including US Highway 93 in Nevada and Arizona, and Highway 163 in Nevada. Road traffic on park roads and developed area access road also generates noise (Figure 9). Noise is generated from vehicles on the backcountry approved road system on a more infrequent basis. The level and intensity of noise from the road system depends on the type of vehicles, topography of the area, vegetation, and other factors.

Noise from NPS operations other than aerial operations occurs primarily on roadways and in or adjacent to park developed areas. Noise that could affect wilderness resources and natural soundscapes includes noise generated from road maintenance operations that utilize trucks, graders and other heavy equipment; noise generated from the use of motorized equipment in landscaping operations in developed area; and construction and facility maintenance-generated noise.

Noise can be generated outside the developed areas for resource restoration and protection projects. Between May and November, operations related to fire management and ecosystem restoration occur on the Shivwits Plateau. Personnel often utilize mechanized equipment (i.e. chainsaws) to remove trees for restoration purposes. Selected springs in the park are treated for brief period of time once a year to remove exotic vegetation, such as tamarisk. Chainsaws are utilized to remove large stands of dense tamarisk. Fire may also be utilized. Follow-up actions utilize non-mechanized hand trimmers.

Figure 9. Area Roads



## **ALTERNATIVE A - No Action**

### **Wildlife, Wildlife Habitat and Sensitive Species of Concern**

Law enforcement patrols: There would be no impact to wildlife, wildlife habitat, and sensitive species from aerial law enforcement patrols. There could be slight disturbance to wildlife from the use of other patrol methods, such as vehicles on approved roads. If horseback patrols are used, there would be the potential for the introduction of invasive weed species in the patrol areas. This could alter the natural community of the area, potentially changing the quality of the habitat for wildlife.

Radio Tower Maintenance: There would be no impact to wildlife species from aerial operations due to radio tower maintenance activities.

Wildlife Surveys, Monitoring and Removal: There would be no impact to wildlife and wildlife habitat due to the disruption from the low-level aerial surveys. Failure to conduct monitoring flights would have no direct impact on wildlife or species of concern. However, wildlife management activities would be conducted without the knowledge regarding population densities and herd movements gathered from aerial operations and the proposed studies. This could lead to ineffective management practices and place certain species at risk, including desert bighorn sheep and razorback suckers. Sheep transplants would not occur under this alternative. This could compromise the viability and sustainability of certain bighorn herds outside the recreation area. On a regional basis, since Lake Mead NRA has one of the most important desert bighorn sheep populations, major adverse impacts could occur if it is not managed effectively.

Capture operations for burros would not be as effective without the use of helicopters. It is likely that burros would not be removed from the more remote portions of the recreation area where access by roads is not possible. This could lead to an overabundance of burros in these areas, leading to resource damage and altering the wildlife habitat. Under this alternative, it is likely that effective burro management would not occur in the recreation area, and the goals of the Lake Mead NRA Burro Management Plan and Strategic Plan would not be met. This could create moderate to major impacts on wildlife habitat where large populations of burros are present.

Resource Management Activities: There would be no impact to wildlife species from aerial operations associated with spring restoration and mine rehabilitation. There could be negligible temporary disturbances to wildlife species due to the presence of humans in the project area.

Operations on the Grand Canyon-Parashant NM: Aerial wildlife and resource monitoring, and aerial law enforcement patrols would not be conducted under this alternative. Due to the size and remoteness of the area, and the lack of roads, monitoring would not be as effective without the use of helicopters or fixed-wing aircraft. Horseback patrols could be used in many areas, and this has the potential to spread

invasive weed species in the region, which could adversely impact the wildlife habitat in the area.

Cumulative Effects: Wildlife would continue to be adversely impacted by the noise caused by ongoing and future aerial operations, particularly low flying helicopters that occur on a frequent basis over Lake Mead NRA. The impacts associated with low-level aerial operations include displacement and disturbance from normal activities. These impacts can be major if they occur on a frequent basis.

Without desert bighorn sheep monitoring, which allows managers to assess the population status and distribution, it would be difficult to make sound management decisions regarding harvest, augmentations, habitat conservation and enhancement, and incompatible activities in bighorn habitat. This could lead to ineffective management of the desert bighorn sheep program at Lake Mead NRA, and create long-term adverse impacts to the overall health of the desert bighorn sheep population in Nevada and Arizona.

Conclusion: No impacts to wildlife and wildlife habitat would occur from aerial operations related to management activities. Moderate to major adverse impacts would continue due to existing and potential future aerial overflights and tours.

Wildlife habitat could be altered without effective management of burro populations, and with the use of horseback for patrols and monitoring activities, through the introduction and spread of invasive plant species. This could create moderate to major adverse impacts on wildlife habitat in these areas.

Without effective wildlife monitoring and management activities, there could be moderate to major adverse impacts on species such as the desert bighorn sheep.

There would be no impairment to wildlife and wildlife habitat from the impacts associated with the no-action alternative.

### **Natural Soundscapes**

Under this alternative, no disruption to the natural soundscape would occur from low-flying aircraft due to NPS aerial operations.

Law enforcement patrols: There would be minor adverse impacts from the use of motorized vessels and vehicles during law enforcement patrols. Although patrols would only occur on approved roads and on the lakes, which are outside wilderness areas, there would be indirect impacts to the natural soundscape in wilderness areas from the use of motorized vehicles and vessels adjacent to the units, since sound can travel a great distance in the desert. Sound from vehicles and vessels can be heard within wilderness areas, and can alter the natural soundscape. Patrols are frequent, can occur at any time, and are often not scheduled. Therefore, at any given time, in any wilderness area, there can be indirect impacts from motorized law enforcement patrols.

Radio tower maintenance: There would be negligible to minor impacts to the project areas associated with vehicle noise on approved roads and noise from personnel working on radio tower maintenance projects. More time would be needed in each area because of the difficult nature of access by vehicle and foot. Therefore, these negligible to minor impacts are estimated to occur for weeklong periods instead of periods of several hours per site.

Wildlife Survey, Monitoring and Removal: There would be negligible to minor impacts associated with vehicle noise on approved roads and noise from personnel working on these projects. More time would be needed in each area due to the scope of the monitoring and the size of the removal areas. Therefore, negligible to minor impacts are estimated to occur for 2 to 3 weeks per operation instead of an estimated period of 2 to 3 days for the same activity.

Resource Management Activities: There would be negligible to minor impacts associated with vehicle noise on approved roads and noise from personnel working on resource management projects. More time would be needed because of the difficult nature of access by vehicle and foot. Therefore, these negligible to minor impacts are estimated to occur for a period of weeks rather than days.

#### Operations on the Grand Canyon-Parashant NM

There would be negligible to minor impacts to the project areas associated with vehicle noise on approved roads and noise from personnel patrolling and conducting wildlife and resource monitoring. More time would be needed in each area because of the difficult nature of access by vehicle and foot. Therefore, these negligible to minor impacts are estimated to occur for weeks at a time during the summer and fall, instead of a period of several hours per site.

Cumulative Effects: There would continue to be impacts to the natural soundscapes, including wilderness soundscapes, from ongoing activities, including air tours and non-NPS overflights, vehicular traffic, boats and personal watercraft. The impacts to the natural soundscape from aerial overflights and air tours are particularly critical in wilderness areas, where the expectation of natural quiet and solitude exists. Currently, impacts to the natural soundscape from these activities have been noted in several wilderness areas, including the Muddy Mountain, Pinto Valley, Black Canyon, Nevada, and Kingman Wash, Fire Mountain, Bonelli Landing, Mt. Wilson, Gregg's Hideout, Temple Bar, Arizona Strip, and the Grand Canyon-Parashant NM, Arizona. Frequent flights over these areas can disrupt the natural soundscape for hours at a time during the day as tours can follow the same route during busy periods. Fixed-wing operations can occur at dusk and during the evening, and create adverse impacts on the natural soundscape during these periods.

Vehicle traffic creates impacts primarily around developed areas, on adjacent and internal highways, and on paved and approved roads within the recreation area. There is also illegal off-road vehicle use that disrupts the natural soundscape. Highways and paved roads can create adverse impacts to the natural soundscape on a frequent and continuing

basis. The most highly traveled roads within the recreation area include U.S. Highway 93 and Highway 163, and Lakeshore Road, Northshore Road to Callville Bay, and Katherine Access Road. Approved backcountry roads are used less frequently and at a slower pace, thus creating infrequent adverse impacts to the natural soundscape, but these impacts could occur for a longer duration per vehicle depending on the terrain and vegetation in that area. All roads within the recreation area are outside of wilderness, therefore, the impacts associated with the use of roads is indirect, but could be minor to moderate depending on the frequency and duration of the vehicular noise.

Illegal off-road vehicle use can and does occur within wilderness areas, so it can directly impact the natural soundscape. The use of four-wheel drive vehicles and motorbikes can adversely affect the natural soundscape in the area of the use, and in adjacent areas depending on the type of vehicle, terrain and vegetative community.

Motorized vessels and personal watercraft create noise on Lakes Mead and Mohave. Under the Lake Mead NRA *Lake Management Plan* (2002), within the next ten years, only the newer, quieter engines will be allowed on the lakes. However, existing and increasing future use will continue to produce noise and adverse impacts to the soundscape on and around the lakes.

Most human-generated noise can be heard miles away from the source due to the terrain and sparse desert vegetation, and can create minor to major impacts. The impacts associated with human-generated noise include intrusion on the solitude and disruption in wilderness.

Conclusion: There would be no direct impacts to natural soundscapes under this alternative from aerial operations associated with NPS management and maintenance projects. There would continue to be minor to major cumulative impacts to the natural soundscape at Lake Mead NRA and in the wilderness due to ongoing and future non-NPS overflights, use of vehicles, and motorized vessels. No impairment to natural soundscapes is associated with Alternative A.

### **Visual Resources**

Under the no-action alternative, visual resources and viewsheds would not be directly impacted from NPS low-flying aircraft utilized for law enforcement patrols, maintenance, and resource activities. There would be negligible impact for the use of motorized vehicles on approved roads, and from crews hiking or using horsebacks for patrol and project access.

Law Enforcement and Maintenance Activities: There would be no impact to the visual resources from these activities.

Resource Management Activities: The visual resources, including the sight of wildlife in their natural environment, could be negatively impacted if bighorn sheep populations are reduced and placed at risk due to lack of effective management. Visitors may not see sheep as frequently, thus detracting from the visual resources of the area.



Operations on the Grand Canyon-Parashant NM: Management-related aerial operations would not be permitted on Grand Canyon-Parashant NM under this alternative, so no direct impact from these types of operations would occur to the visual resources. However, if resource management goals are not met, and resource monitoring by other methods is not effective, there is the potential for impacts to the resource. The impacts that could adversely affect the visual resources related to the overall health of the ecological community. The Ponderosa pine stands would be adversely impacted if monitoring was not effective and disease or parasite infestation goes undetected. This would create major impacts to the visual resources of the area. If wildlife monitoring was not effective, wildlife populations, such as mule deer, could be reduced. Visitors may not view mule deer or other wildlife, thus detracting from the visual resources of the area.

Cumulative Effects: Aerial overflights and air tours within Lake Mead NRA and wilderness areas would continue to adversely impact the visual resources, particularly low-level flights. These impacts are associated with the disruption to the wilderness experience from viewing a human-made object in wilderness. The impact would be adverse, and temporary to long-term, depending on the viewer's perception of what is an appropriate visual experience in wilderness.

Conclusion: There would be minor to moderate adverse cumulative impacts to visual resources resulting from the no-action alternative and the continuation of air tours and overflights in wilderness. This would depend on the wilderness visitor's perception as to what is appropriate in wilderness. There would be no impairment to the visual resources or viewshed from this alternative

### **Visitor Experience**

Under the no-action alternative, visitor experience in Lake Mead NRA and wilderness areas would not be impacted from the aerial operations associated with park management activities.

Law Enforcement and Maintenance Activities: If certain management and maintenance activities are not allowed to continue, including the law enforcement patrols and maintenance of park radio towers and equipment, this could result in a less safe recreational environment for park visitors and employees. Rangers may not be able to respond as quickly to visitors' accidents or emergencies which could lead to more severe injuries or death. Illegal off-highway vehicle activity, which impacts visitor experience, may not be detected without aerial law enforcement patrols.

Resource management activities: Many visitors enjoy seeing wildlife, including desert bighorn sheep within the recreation area. In addition, hunting permits are authorized in certain areas for bighorn sheep. If populations are not managed effectively, both these visitor experiences are at risk. Visitors and hunters could be negatively impacted if bighorn sheep populations are reduced and placed at risk due to lack of effective management. Visitors may not see sheep as frequently, thus detracting from their

experience. Hunting permits may be reduced, leading to dissatisfaction among hunters throughout the state, and in the West.

Operations on the Grand Canyon-Parashant NM: Management-related aerial operations would not be permitted on Grand Canyon-Parashant NM under this alternative, so there would be no direct impact to visitors from these types of operations. As stated above, if certain management and maintenance activities are not allowed to continue, including the law enforcement patrols and maintenance of radio towers and equipment, this could result in a less safe recreational environment to park visitors and employees. Rangers may not be able to respond as quickly to visitors' accidents or emergencies which could lead to more severe injuries or death. Illegal off-highway vehicle activity, which impacts visitor experience, may not be detected without aerial law enforcement patrols.

If resource management goals are not met, and resource monitoring by other methods is not effective, there is the potential for impacts to the visitor experience. If resource monitoring was not effective, wildlife populations, such as mule deer, could be reduced. Visitors may not view mule deer or other wildlife, thus detracting from their experience. If resource monitoring was not effective and disease or invasive species changed the natural community of the area, visitors may be negatively impacted due to the lack of tress and native plants, or the sight of diseased and dying trees.

Cumulative Effects: There would continue to be direct minor to moderate adverse impacts to wilderness users from ongoing and future overflights and air tours within the recreation area and in the national monument. Many of the direct impacts relate to the natural soundscape and visitor's expectations in wilderness areas, as discussed previously.

Conclusion: There could be moderate to major adverse impacts to the visitor experience from the no-action alternative due to the lack of emergency communications within the recreation area. If wildlife populations (i.e. bighorn and mule deer) within the recreation area and national monument are reduced due to ineffective management, then visitors and hunters may be negatively impacted. Impacts from non-NPS overflights would continue to adversely affect wilderness users who are searching for solitude and natural quiet.

### **Safety**

Under the no-action alternative, there would be no staff or contractors placed at risk from the aerial operations.

Law Enforcement and Maintenance Activities: Visitors and park employees could be placed at risk if radio communications were not operational and law enforcement patrols were not adequate. Park employees who perform radio maintenance activities could be placed at risk if they were to hike in equipment and supplies instead of utilizing helicopters and aerial sling-loads from transportation. Desert travel is often difficult, and since the radio towers are located on high peaks, access would be through rugged, steep terrain. The extreme weather conditions often make this option infeasible. The use of

horseback for patrols and transport can pose a safety hazard to park employees due to the terrain and extreme weather conditions at Lake Mead NRA.

Resource Management Activities: Resource employees could be placed at risk if they were to hike in equipment and supplies instead of utilizing aerial sling-loads. Desert travel and travel within riparian areas and canyons is often difficult due to the distance and the rugged terrain. Extreme weather conditions can adversely affect the safety of park employees.

Operations on the Grand Canyon-Parashant NM: Visitors and park employees could be placed at risk if radio communications were not operational and law enforcement patrols were not adequate. Hiking and horse travel can be risky to employees because of the rugged nature of the terrain and the extreme weather conditions.

Cumulative Effects: None.

Conclusion: Visitors and employees would be placed at risk if radio communications were not operational, law enforcement operations were not adequate, and hiking and horseback travel were utilized. This could lead to moderate to major adverse impacts to safety and park operations.

### **Wilderness**

Wilderness impacts are associated with biophysical and experiential effects. Biophysical effects include the ecological health of the area, including wildlife. Experiential effects include opportunities for solitude, natural quiet, self-reliance and discovery. Natural quiet was addressed previously under “Soundscapes” and solitude was addressed under “Visitor Experience.”

Law Enforcement and Maintenance Activities: Aerial law enforcement and maintenance activities would not occur under this alternative. Patrols within wilderness areas would be restricted to foot travel or by horseback. Access would be gained by using the park paved and approved roads, which are located outside of wilderness areas. The use of non-motorized equipment is consistent with wilderness use and purposes.

Resource Management Activities: Resource management activities would occur without the use of aerial transportation. Many, such as wildlife monitoring and capture operations, would not be as effective without the use of fixed-wing aircraft and helicopters. Without effective resource management, the ecological health of the resources within Lake Mead NRA, which is considered essential to the character of the wilderness areas within Lake Mead, could be at risk. This could create moderate to major adverse impacts to wilderness areas.

Operations on the Grand Canyon-Parashant NM: Aerial law enforcement and maintenance activities would not occur under this alternative. Patrols within wilderness areas would be restricted to foot travel or by horseback. Access would be gained by

using the park approved roads, which are located outside of wilderness areas. The use of non-motorized equipment is consistent with wilderness use and purposes.

Resource management activities would occur without the use of aerial transportation. Many, such as wildlife monitoring, would not be as effective without the use of fixed-wing aircraft and helicopters. Without effective resource management, the ecological health of the resources within the national monument, which is considered essential to the character of the wilderness areas, could be at risk. This could create moderate to major adverse impacts to wilderness areas.

Cumulative Impacts: As stated in the previous impact topics, wilderness visitors are currently being impacted by aircraft overflights. Cumulative impacts to wilderness users from aircraft include minor to moderate impacts from noise and visual disturbance, and reduced opportunity for solitude.

Conclusion: Under the no action alternative, there would continue to be minor to moderate negative impacts to the wilderness resource and wilderness visitor from aircraft overflights. There could be moderate to major adverse impacts to the resources in wilderness from the lack of management activities. There would be no impairment to wilderness as a result of the impacts associated with this alternative.

## **ALTERNATIVE B – Conduct Administrative Helicopter and Fixed-Wing Flights (Preferred Alternative)**

### **Wildlife, Wildlife Habitat, and Sensitive Species of Concern**

Law enforcement patrols: Fixed wing law-enforcement patrols utilizing a single propeller Cessna fixed wing airplane occur a minimum of twice weekly and are generally at 800 to 1,000 feet above ground level. If suspicious activities or close inspection warrants, the plane will go no lower than 700 feet above ground level and can circle an individual area for 5 to 20 minutes, depending on the situation. These flights are parkwide, but spend a minimal amount of time over each location. Since they are at a higher altitude, they generally do not disrupt wildlife activities or habitat and create no to negligible impacts.

Radio tower maintenance: Radio tower maintenance activities would utilize a helicopter to transport personnel and supplies to each radio site, as specified under the preferred alternative. Landing and taking off on site would create the most impact, since flights to and from the site are generally at least 800 feet above ground level. Landing and taking off at sites could temporarily disrupt wildlife in that area through noise disturbance and displacement from habitat. All sites are on or near mountain peaks, and if desert bighorn sheep are present, they avoid landing at the site and find an alternative location to land where disruption would not occur. Therefore, there would be negligible to minor impacts to wildlife from this activity.

Wildlife monitoring and capture operations: Low level flights (helicopter of fixed wing) have the potential to displace and/or disrupt normal behavior patterns of wildlife, such as deer and bighorn sheep. Wildlife in the immediate location of flights and where landing would occur would be disrupted and temporarily displaced to available habitat nearby. Implementation of alternative B would result in localized, short-term, minor adverse impacts since flight response behavior is expected without interference with activities necessary for survival.

Under alternative B, resource management activities would be implemented and information would be available for sound management practices and decision-making.

Depending on aerial survey results, individuals from bighorn sheep herds may be captured and transplanted to aid in recovery of bighorn herds elsewhere. Bighorn sheep captures and transplanting would help restore populations to their optimal levels and aid in sustainability and diversity of the herd. Desert bighorn sheep would be directly disturbed if they are captured and tagged, and/or relocated. Mitigation should prevent major impacts to individual sheep. However, there is the possibility that the capture operation or relocation could lead to direct mortality of individual sheep. Desert bighorn sheep management activities would result in long-term beneficial effects to bighorn populations.

Resource Management Activities: Utilizing a helicopter to sling-load supplies would occur on the first and last days of the project. The helicopter may remain on site in case of medical emergency. The sling-load operation would create minor, temporary disturbance to wildlife in and adjacent to the project area from noise and displacement from habitat, primarily when the helicopter takes off and lands.

Operations on the Grand Canyon-Parashant NM: Aerial operations and monitoring activities could temporarily disrupt wildlife in the vicinity of the flights, particularly the low-level helicopter flights utilized for wildlife monitoring. Other monitoring flights are generally at or above 800 feet above ground level, are infrequent, and create temporary, negligible to minor adverse impacts to wildlife species.

Cumulative Effects: As discussed under alternative A, wildlife are currently disturbed and their normal activities can be disrupted by low-level flights over Lake Mead NRA, in particular, low-level helicopter flights. This could continue in the near future. The proposed action would contribute negligibly to the cumulative impacts.

Conclusion: There would be negligible to minor, short-term, adverse impacts to wildlife from alternative B around project areas due to temporary displacement during air operations. This would occur primarily from the use of helicopters, when they are landing or taking off, or flying at low-levels during census operations.

Individual bighorn sheep could be directly impacted from the management operations. In the long-term, bighorn sheep populations would benefit from efficient and science-based

management. Effective management of exotic vegetation and overpopulations of burros could improve the ecological community and wildlife habitat.

No impairment would occur to wildlife, wildlife habitat, and sensitive species from the impacts associated with this alternative.

### **Natural Soundscapes**

**Law enforcement patrols:** Law enforcement patrols would occur over wilderness areas at least twice a week, at an elevation of 800 to 1,000 feet above ground level, with occasional flights at 700 feet above ground level if the situation warrants. Depending on the size of extent of the wilderness areas, flights are only over each wilderness area for 15 to 30 minutes at a time, unless there are law enforcement issues in that area, or it is a special wilderness patrol, which could take one to two hours per area.

Human-generated noise from the fixed-wing Cessna utilized for law enforcement patrols would occur over wilderness areas. Since the flights are primarily at 800 to 1,000 feet above ground level, and are in specific wilderness areas for a short duration, and there is only one aircraft utilized for these purposes, the impact to the natural soundscape would be temporary, adverse, and minor.

**Radio tower maintenance:** One NPS radio tower is located within an area considered suitable for wilderness designation, near Mount Wilson. The others are located outside of wilderness and access would also be outside of wilderness. There would be temporary adverse impacts to the natural soundscape in the Mount Wilson area due from accessing the radio tower site, and from the noise generated from taking off and landing since that is when the helicopter would be closest to ground level. The impacts to the natural soundscape would occur a minimum of two times per year, when scheduled radio maintenance is required. Flights also occur to conduct emergency maintenance activities on an unscheduled basis, but generally about two more times per year. Flights into the Mount Wilson area generally take approximately one hour each way, with 30 minutes of actual flying in the wilderness area.

**Wildlife monitoring and capture operations:** Low level flights for censusing and capture operations would disrupt the natural soundscape of that particular project area. The duration of the flights would vary from 2 to 6 hours, creating temporary moderate impacts to the soundscape near project activities.

Flights would usually be scheduled during weekdays, avoiding weekends if possible, and would avoid periods of peak visitor use. Landing helicopters to secure and transport bighorn and burros would have temporary minor adverse impacts to the natural soundscapes in the immediate area. Impacts from aircraft noise would result in short-term, minor to moderate, localized, adverse impacts to the natural soundscapes.

**Resource Management Activities:** Utilizing a helicopter to sling-load supplies would occur on the first and last days of the project (2 days total). The helicopter may remain

on site in case of medical emergency, but it would not be in operation unless necessary. The sling-load operation would create minor, temporary disturbance to the natural soundscape in the area, primarily when the helicopter takes off and lands. This would result in minor, temporary disturbances to the natural soundscape in the project area.

#### Operations on the Grand Canyon-Parashant NM

Law enforcement and resource monitoring patrols would occur occasionally throughout the Grand Canyon-Parashant NM.

Aerial operations and monitoring activities could temporarily alter the natural soundscapes in the vicinity of the flights, with the primary adverse impact resulting from low-level helicopter flights utilized for wildlife monitoring. This type of activity would occur infrequently, 2 to 4 days per year, with several hours spent flying over each area.

Wilderness monitoring would occur 2 to 3 times per year. Ponderosa pine monitoring would occur 1 to 2 days per year. Range activity monitoring would occur 4 to 5 days per year. Law enforcement flights would occur 2 to 3 times per year (BLM and NPS) and AGFD law enforcement flights occur 5 to 10 times per year, at various times, with the purpose of identifying violations of state law including illegal hunting and off-road driving. Other infrequent monitoring and law enforcement flights would utilize fixed-wing aircraft and are generally at or above 800 feet above ground level, which would create temporary, negligible to minor adverse impacts to the natural soundscape.

Cumulative Effects: The ongoing and future aerial operations are described in detail under alternative A. The impacts of the proposed flights under alternative B, when considered with other existing and potential future aerial operations (private, air tours, commercial flights, and military operations) would not result in significant additional cumulative adverse impacts. Management-related fixed-wing flights would occur at least twice a week, generally between 800 and 1,000 feet above ground level, with a varied route to cover the entire park when possible. Other operations, such as the use of project helicopters, are very infrequent, would occur in selected areas for short periods of time, and mitigation would be adopted to reduce the impacts to wilderness and visitors. Considering this, the proposed action would contribute negligibly to the cumulative impacts.

Conclusion: Under alternative B, there would be minor to moderate, short-term, adverse impacts on natural soundscapes in wilderness areas due to aerial operations. The impacts are considered minor to moderate because the noise generated from flight activities are detectable, but are infrequent and temporary. Cumulative impacts from current flights and air tours over Lake Mead NRA would continue to adversely impact park soundscapes, but the impacts from the operations proposed under this alternative would not add to this impact significantly. No impairment to natural soundscapes would occur from implementation of this alternative.

## **Visual Resources**

In general, the presence and observation of low-flying aircraft could disrupt the wilderness experience for visitors near the project areas. However, some visitors may enjoy seeing aircraft as part of the visual resource.

**Law Enforcement and Maintenance Activities:** Short-term, negligible impacts to visual resources would occur during aerial law enforcement activities, since law enforcement-related fixed-wing flights would take place at or above 800 feet above ground level and would occur approximately twice per week, in different areas of the park. Radio tower maintenance activities would create short-term negligible impacts to visual resources since they would occur twice per year at each site.

**Resource Management Activities:** Resource management activities such as low-level helicopter use for transporting materials, monitoring, and census and animal removal projects could create temporary minor adverse impacts to the visual resources in the project areas during the period of the operation. The level of adverse impact depends upon the visitor's expectations of visual resources in and around the project sites. Impacts would be more noticeable in wilderness areas, where there are expectations of a pristine visual environment without human influence and objects.

**Operations on the Grand Canyon-Parashant NM:** Monitoring and law enforcement operations on the Grand Canyon-Parashant NM would utilize both fixed-wing airplanes and helicopters. The fixed-wing airplane utilized for law enforcement would generally fly at 800 feet above ground level or higher. Helicopters could fly at lower altitudes depending on the project work. Since these operations would occur only occasionally, for limited periods of time, the impact to the visual resources would be temporary, minor, and adverse.

**Cumulative Effects:** The observation of low-flying aircraft associated with air tours (as discussed under alternative A) can detract from the viewshed and create temporary negative impacts to park visual resources. The additive impacts from the proposed management-related aerial operations under this alternative would be temporary and occasional, would occur during project and law enforcement work only, and would be restricted to project areas or at or above certain altitudes. Therefore, the proposed action would contribute negligibly to the cumulative impacts.

**Conclusion:** Implementation of alternative B would result in short-term, negligible to minor impacts to visual resources due to the observation of low-flying aircraft, particularly in wilderness.

## **Visitor Experience**

Visitors to wilderness areas generally expect quiet and solitude, devoid of artificial noise and non-natural objects. Much of the visitor experience in wilderness depends upon their expectations of the natural soundscapes and visual resources, as discussed above.



Law Enforcement and Maintenance Activities: There could be short-term adverse minor impacts to the visitor experience, particularly in wilderness areas, from the presence and sound of airplanes and helicopters. Ongoing maintenance to park radio towers would assure quick law enforcement response and more effective search and rescue operations. Law enforcement flights would allow park rangers to more effectively determine problem areas and areas where visitor assistance is needed. This would benefit the park visitor.

Resource Management Activities: During project flights, visitors near the project area would be impacted from sound and visual intrusions. This would result in short-term, adverse impacts to visitor experience in a wilderness area. Visitors would be impacted as little as a few minutes, or as much as several hours at a time for several days, depending on where they are and the schedule of the management activities.

Visitors could experience beneficial impacts in the long-term from the successful implementation of resource management and visitor protection activities. Restoring the wilderness to natural conditions, and maintaining native wildlife populations, can improve the visitor experience. Closing and rehabilitating mine sites could reduce visitor hazards.

Operations on the Grand Canyon-Parashant NM: There would be short-term minor adverse impacts to visitors in wilderness areas on the monument due to the noise and presence of airplanes and helicopters. This would occur infrequently during monitoring and law enforcement activities. However, the visitor could benefit from law enforcement flights if they require assistance. Visitors could benefit from resource management activities as they would assure the wilderness resource is preserved and protected, and wildlife populations are maintained.

Cumulative Effects: Wilderness visitors at Lake Mead NRA are currently impacted by air tours and overflights. This impact would continue under the no-action alternative. The addition of aerial law enforcement patrols and helicopter use for project work would contribute negligibly to the cumulative impacts.

Conclusion: Visitors in wilderness areas where the project is occurring would experience short-term, minor to moderate adverse impacts due to the visual and noise impacts from low flying aircraft in a backcountry area. Visitors could benefit from the continued maintenance of radio towers and from habitat restoration, wildlife management, and mine closures.

### **Safety**

As with any aerial operation, there are inherent risks involved to participants. Mitigation measures and compliance with required policies serve to reduce the risks. However, the risks can not completely be eliminated. Therefore, there is the potential for injury and loss of human life during these operations. If this occurs, severe, irreversible adverse impacts would result to individuals involved in project work.

Beneficial impacts to visitors and employees would result from improved safety conditions from law enforcement patrols, radio communications, and mine closures.

Cumulative Effects: None

Conclusion: Even with following required policies and safety mitigation, there could be severe, irreversible impacts to participants in the aerial operations. Visitors and park employees would benefit from improved conditions related to patrols, communications, and mine closures.

**Wilderness**

Wilderness impacts are associated with biophysical and experiential effects. Biophysical effects include the ecological health of the area, including wildlife. Experiential effects include opportunities for solitude, natural quiet, self-reliance and discovery. Natural quiet was addressed previously under “Soundscapes” and solitude was addressed under “Visitor Experience.”

Law Enforcement and Maintenance Activities: Law enforcement activities using fixed-wing aircraft at approximately 800 to 1,000 feet above ground level may temporarily detract from the experiential effects within wilderness areas during the period when the aircraft is flying above the wilderness area. This would create short-term minor adverse impacts to the wilderness resource. It could impact any wilderness area on any given day within the recreation area because law enforcement patrols occur on a parkwide basis and patrol areas change periodically. Generally patrols are only over selected areas for minutes at a time unless there is a law enforcement issue in the area, in which case the plane could circle the area for a period of 15 to 30 minutes or longer. Special wilderness patrols could take one to two hours per wilderness area.

The Mount Wilson wilderness area (NPS) would be impacted by helicopter use at least twice a year for scheduled radio tower and repeater maintenance, and may be impacted two or more times per year if emergency maintenance is required. Flights into the Mount Wilson area generally take approximately one hour each way, with 30 minutes of actual flying in the wilderness area. There would be short-term, minor adverse impacts to the experiential wilderness resources.

Wildlife monitoring and capture operations: Landing helicopters to secure and transport bighorn and burros, supplies, and personnel would have temporary minor adverse impacts to the wilderness resource in the immediate area. Impacts from aircraft noise would result in short-term, minor to moderate, localized, adverse impacts to the wilderness resource.

Project operations using low level helicopters, such as monitoring, censusing, and capturing and removing animals, could create temporary, minor to moderate, adverse impacts to the wilderness experiential resource in the selected project areas. The duration of the flights within each project area varies from 2 to 6 hours, creating temporary moderate impacts to the wilderness resource near project activities.

Resource Management Activities: Allowing appropriate resource management activities within wilderness would preserve the ecological health of the bighorn sheep herd and restore the natural processes within Lake Mead NRA. These are important resources related to the preservation of the wilderness character within Lake Mead.

Utilizing a helicopter to sling-load supplies would occur on the first and last days of the project (2 days total). The helicopter may remain on site, staged outside of the wilderness area, in case of medical emergency, but it would not be in operation unless necessary. The sling-load operation would create minor, temporary disturbance to the wilderness resources in the area, primarily when the helicopter takes off and lands. This would result in minor, temporary disturbances to the project area.

Operations on the Grand Canyon-Parashant NM: Law enforcement and resource monitoring patrols would occur occasionally throughout the Grand Canyon-Parashant NM. Aerial operations and monitoring activities could temporarily alter the wilderness resource in the vicinity of the flights, with the primary adverse impact resulting from low-level helicopter flights utilized for wildlife monitoring. This type of activity would occur infrequently, 2 to 4 days per year, with several hours spent flying over each area.

Wilderness monitoring would occur 2 to 3 times per year. Ponderosa pine monitoring would occur 1 to 2 days per year. Range activity monitoring would occur 4 to 5 days per year. Law enforcement flights would occur 2 to 3 times per year (BLM and NPS) and AGFD law enforcement flights occur 5 to 10 times per year, at various times, with the purpose of identifying violations of state law including illegal hunting and off-road driving. Other infrequent monitoring and law enforcement flights would utilize fixed-wing aircraft and are generally at or above 800 feet above ground level, which would create temporary, negligible to minor adverse impacts to the natural soundscape.

Allowing appropriate resource management activities within wilderness would preserve the ecological health of the region and help to restore the natural processes within Grand Canyon-Parashant NM. These are important resources related to the preservation of the character of wilderness areas.

Cumulative Effects: As stated in the previous impact topics, the wilderness resources and visitors are currently being impacted by air tours and overflights. Cumulative impacts to wilderness resources from aircraft include minor to moderate adverse impacts from noise and visual disturbance, and reduced opportunity for solitude. Considering the frequency and number of existing and future potential air tours and overflights that occur within wilderness areas at Lake Mead NRA and Grand Canyon-Parashant NM, the proposed action would contribute negligibly to the cumulative impacts.

Conclusion: Under this alternative, there would continue to be minor to moderate negative impacts to the wilderness resource and wilderness visitor from aircraft overflights. The ecological health of the wilderness areas would be preserved as resource management objectives in wilderness are accomplished. There would be no impairment to wilderness from the impacts associated with implementation of alternative B.

*Page left intentionally blank.*

---

## **SECTION V: COORDINATION AND CONSULTATION**

---

A 30-day public scoping period occurred between September 24 and October 25, 2004, through a press release (Appendix B). A single comment supporting the project but emphasizing the need for safety was received. The scoping press release was sent to television stations, newspapers, magazines, and radio stations in Las Vegas, Henderson, Boulder City, Pahrump, Overton, Logandale, Laughlin, Nevada; Meadview, Kingman, Phoenix, and Bullhead City, Arizona; and Needles, and Los Angeles, CA. Government entities receiving notification of the project included the Bureau of Land Management, Bureau of Reclamation, the Southern Nevada Water Authority, the Nevada Division of Wildlife, Arizona Game and Fish Department, the Nevada Department of Transportation, and local government offices in our gateway communities. Other stakeholders, including other NPS units, concessioners, and the congressional delegation of Arizona and Nevada also received notification of this project.

A press release regarding the availability of this environmental assessment is sent to the above entities for announcement of the proposed project, and is published on the Lake Mead NRA Internet Web site (<http://www.nps.gov/lame>). Individuals and organizations can request the environmental assessment in writing, by phone, or by e-mail.

Lake Mead NRA's mailing list is comprised of 126 federal and state agencies, individuals, businesses, and organizations. The environmental assessment will be distributed to those individuals, agencies, and organizations likely to have an interest in this project. Entities on the park mailing list that do not receive a copy of the environmental assessment will receive a letter notifying them of its availability and methods of accessing the document. Copies of the environmental assessment are available at area libraries, including: Boulder City Library, Clark County Community College (North Las Vegas), Clark County Library, Las Vegas Public Library, Mohave County Library (Kingman, AZ), Sunrise Public Library (Las Vegas), University of Arizona Library (Tucson, AZ), University of Nevada- Las Vegas James R. Dickinson Library, Meadview Community Library, Moapa Valley Library (Overton, NV), Mesquite Library, Mohave County Library (Lake Havasu City, AZ), Laughlin Library, Searchlight Library, and Washington County Library (St. George, UT). Comments on this document will be accepted during the 30-day review period.

A copy of the environmental assessment can be obtained by direct request to:

National Park Service, Lake Mead NRA  
Attention: Compliance Office  
601 Nevada Way  
Boulder City, Nevada 89005  
Telephone: (702) 293-8956  
Facsimile: (702) 293-8008

---

**SECTION VI: LIST OF PREPARERS AND CONSULTANTS**

---

Michael Boyles, Environmental Compliance Specialist  
Kent Turner, Chief of Resource Management  
Chanteil Walter, Environmental Protection Assistant  
Jim Holland, Park Planner

---

## SECTION VI: LIST OF REFERENCES

---

### U.S. Public Laws, Codes, Federal Regulations, Statutes, and Acts

All U.S. Public Laws, Codes, Federal Regulations, and Statutes can be found at the Office of the Federal Register, U.S. Government Printing Office, Washington, DC. Many can be found on the Internet at <http://www.gpo.gov>.

*Clark County Conservation of Public Land and Natural Resources Act of 2002. Public Law 107-282.*

*Enabling Legislation. See U.S. Public Law 88-639.*

*Endangered Species Act of 1973. U.S. Code. Vol.16, sec. 1531 et seq., U.S. Public Law 93-205.*

*National Environmental Policy Act of 1969 (NEPA). U.S. Code. Vol. 42, secs. 4321-70a, U.S. Public Law 91-190.*

*National Parks Air Tour Management Act of 2000. 114 Stat. 61, U.S. Public Law 106-181.*

*National Park Service Organic Act of 1916. U.S. Code. Vol. 16, sec. 1.*

*Proclamation for Establishment of Grand Canyon-Parashant National Monument. 2002.*

*Redwood National Park Expansion Act of 1978. U.S. Public Law 102-575, Title 28.*

*U.S. Public Law 88-639. "Enabling Legislation," Lake Mead National Recreation Area. 88<sup>th</sup> Cong., 653d sess., 8 October 1964.*

*Wilderness Act of 1964. U.S. Code. Vol. 16, secs. 1131-1136, U.S. Public Law 88-577.*

### References Cited

Arizona Game and Fish Department

2001 *Strategic Plan Wildlife 2006.* Arizona Game and Fish Department, Phoenix, Arizona.

2001 *Arizona Strip Desert Bighorn Sheep Management Plan, amended.* Arizona Game and Fish Department, Phoenix, Arizona.

Council on Environmental Quality, Executive Office of the President

1978 "Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act." *Federal Register* 43:55978-56007.

National Park Service (Department of the Interior)

- 1979 "Lake Mead National Recreation Area Wilderness Proposal." Boulder City, Nevada.
- 1986 *Final Environmental Impact Statement, Lake Mead National Recreation Area General Management Plan.* Boulder City, Nevada.
- 1994 *Lake Mead National Recreation Area Resource Management Plan.* Boulder City, Nevada.
- 1995 *Lake Mead National Recreation Area Burro Management Plan and Environmental Assessment.* Boulder City, Nevada.
- 1999 *Director's Order 41: Wilderness Preservation and Management.* Washington, DC. National Park Service.
- 1999 *Lake Mead National Recreation Area Resource Management Plan.* Boulder City, Nevada.
- 2000 *Director's Order 12: Conservation Planning, Environmental Impact Analysis, and Decision Making.* Washington, DC. National Park Service.
- 2000 "Lake Mead National Recreation Area Strategic Plan, 2000-2005." Boulder City, Nevada.
- 2000 *Director's Order 47: Soundscape Preservation and Noise Management.* Washington DC. National Park Service.
- 2001 "Management Policies." Washington, D.C. National Park Service.
- 2001 National Park Service, Lake Mead National Recreation Area, Park Facts. Internet Web site: <http://www.nps.gov/lame/pphtml/facts.html>.
- 2002 *Lake Mead National Recreation Area Lake Management Plan and Final Environmental Impact Statement.* Boulder City, Nevada.
- 2002 *Current Management Guidance.* National Park Service.
- 2002 *Visitor and Visitor Use Statistics for December, 2002, Lake Mead National Recreation Area.* Boulder City, Nevada.
- 2004 *Environmental Assessment for the Implementation of the Fire Management Plan.* Boulder City, Nevada.



2005 National Park Service, Grand Canyon-Parashant National Monument, Park Facts. Internet Web site: <http://www.nps.gov/para/history.html>.

Nevada Department of Wildlife

2000 *Bighorn Sheep Management Plan*. Nevada Department of Wildlife. Las Vegas, Nevada.

USFWS (US Fish and Wildlife Service).

2002 Threatened and Endangered Species System (TESS). Listings with Current Range in Region 1. Accessed online at:  
[http://ecos.fws.gov/tess\\_public/TESSWebpageRegionLists?lead\\_region=1#NV](http://ecos.fws.gov/tess_public/TESSWebpageRegionLists?lead_region=1#NV)

*Page left intentionally blank.*

---

**APPENDIX A**  
**LAKE MEAD NATIONAL RECREATION AREA**  
**INTERIM GUIDELINES FOR WILDERNESS MANAGEMENT**  
**Minimum Requirement Decision Document**

---

Clark County Conservation of Public Land and Natural Resources Act of 2002  
Public Law 107-282 designated 17 Wilderness Areas in Clark County, Nevada, and expands one preexisting wilderness area. Of these, nine are managed in whole or in part by the NPS, with 4 being jointly managed with the Bureau of Land Management (BLM).

**Table 1. Wilderness Totals**

NPS Total Designated Wilderness: 184,439 acres in Nevada (Figure 1)

<b>Wilderness Areas</b>	<b>Total Wilderness by Acres</b>	<b>NPS Wilderness by Acres</b>	<b>BLM Wilderness by Acres</b>
Black Canyon	17,220	17,220	0
Eldorado	31,950	26,250	5,700
Ireteba Peaks	32,745	22,299	10,446
Nellis Wash	16,423	16,423	0
Spirit Mountain	33,518	32,913	605
Bridge Canyon	7,761	7,761	0
Muddy Mountains	48,019	3,521	44,498
Pinto Valley	39,173	39,173	0
Jimbilnan	18,879	18,879	0

NPS Suitable or Potential Wilderness: approximately 493,000 acres in Nevada and Arizona (including the Lake Mead NRA portion of Grand Canyon-Parashant NM acreage).

**Minimum Requirement Analysis**

*Director's Order #41: Wilderness Preservation and Management* (DO-41) states:

“A process to determine the ‘minimum requirement’ for administrative actions... and equipment use in wilderness will be identified and established. It must specify how the process is to be implemented in the park and that a record of the decisions generated through this process must be kept for public inspection.”

Until a Wilderness Management Plan is completed for Lake Mead NRA, in accordance with the policies set forth in DO-41, these interim guidelines will provide the process to evaluate and analyze activities and programs proposed within designated, suitable, and potential wilderness within Lake Mead NRA, through the minimum requirement process.

The minimum requirement process applies to all administrative actions, programs, and activities within wilderness and potential wilderness additions. In this document, designated, potential, and suitable areas will all be referred to as “wilderness.”

## Definitions

Minimum Requirement is a documented process the NPS will use for the determination of the appropriateness of all actions affecting wilderness. Park managers will apply the minimum requirement concept when making all decisions concerning management of wilderness areas.

Any action that may result in an exception to prohibited uses or have the potential to impact wilderness resources and values must be documented in accordance with the park's minimum requirements process. The minimum requirement process will be conducted through the appropriate environmental analysis.

Minimum Tool means a use or activity determined to be necessary to accomplish an essential task, which makes use of the least intrusive tool, equipment, device, force, regulation, or practice that will achieve the wilderness management objective. This is not necessarily the same as the term "primitive tool," which refers to the actual equipment or methods that make use of the simplest available technology (i.e., hand tools)."

Permitted Public Use: Permitting special uses in wilderness is itself an administrative action, which is subject to the minimum requirement, process. These special uses include all commercial use, special events, and scientific research and are further detailed below.

Emergencies: A true emergency presents an immediate threat to human life, or natural or cultural resources and often requires a quick response beyond that available by primitive means. Emergencies do not require documented analysis prior to approval of a generally prohibited activity or use in wilderness. The Incident Commander needs to determine quickly whether a true emergency exists and should be trained in the minimum requirement concept. The flow chart attached to this document can be used as a quick tool to assist with minimum requirement decisions for emergencies. The rationale for authorizing such use should be documented in the incident report.

## Special Policies

Scientific Research (6.3.6.1). Scientific activities should be encouraged in wilderness. Even those scientific activities that involve a potential to impact wilderness resources or values should be allowed when the benefits of what can be learned outweigh the impacts on the wilderness resources or values.

Scientific activities involving prohibitions identified in Section 4 (c ) of the Wilderness Act may be conducted when:

- The desired information is essential for the understanding, health, management or administration of wilderness, and the project cannot be reasonably modified to eliminate or reduce the nonconforming wilderness use; or if it increases scientific knowledge, even when this serves no purposes, provided it does not compromise the wilderness resources or character.
- All compliance is accomplished and documented.

- All scientific activities will be accomplished in accordance with terms and conditions adopted at the time the research permit is approved.
- The project will not significantly interfere with other wilderness purposes over a broad area or for a long period of time.
- The minimum requirement concept is applied to the implementation and review of the project.

Commercial Services (6.4.4). Wilderness oriented commercial services that contribute to public education and visitor enjoyment of wilderness values or provide opportunities for primitive and unconfined types of recreation may be authorized if they meet the “necessary and appropriate” test of the NPS Concessions Management Act of 1998.

The use of permanent structures including equipment and supply caches is prohibited within wilderness. Managers will ensure that commercial operators are in compliance with established “Leave No Trace” protocols.

Special Events (6.4.5). The NPS will not sponsor or issue permits for special events to be conducted in wilderness if those events are inconsistent with wilderness resources and character, and does not require a wilderness setting to occur.

Permits will not be issued in wilderness areas for:

- Special events that are commercial enterprises
- Competitive events
- Activities involving animal, foot, or watercraft races
- Activities involving physical endurance of a person or animal
- Organized survival exercises
- War games
- Or similar exercises

#### Clark County Conservation of Public Land and Natural Resources Act of 2002

The Clark County Conservation of Public Land and Natural Resources Act of 2002 (P.L. 107-282) established specific management directions for Wilderness designated under this Act.

Section 208. Wildlife Management (c) Existing Activities: Consistent with section 4(d)(1) of the Wilderness Act and in accordance with appropriate policies, the state may continue to use aircraft, including helicopters to survey, capture, transplant, monitor, and provide water for wildlife populations, including bighorn sheep, and feral stock, horses, and burros.

Section 209. Wildfire Management: Consistent with section 4 of the Wilderness Act, nothing in this title precludes the agency from conducting wildfire management operations (including operations using aircraft or mechanized equipment) to manage wildfires in the wilderness areas designated by this title.

Section 210. Climatological Data Collection: Subject to the terms and conditions as the Secretary may prescribe, nothing in this title precludes the installation and maintenance of hydrologic, meteorologic, or climatological collection devices in the wilderness areas designated by this title if the facilities and access to the facilities are essential to flood warning, flood control, and water reservoir operations.

Section 211. National Park Service Lands: To the extent any of the provisions of this title are in conflict with laws, regulations, or management policies applicable to the National Park Service for Lake Mead NRA, those laws, regulations, or policies shall control.

*The Minimum Requirement Decision Process – Part I*

Produce any required documentation on separate sheets.

*Step 1*

Determine whether the proposed action or components of the program takes place in designated Wilderness, suitable or potential wilderness.

In general, Wilderness boundaries fall 100 feet from the center line of all paved and approved backcountry roads, and 300 feet from the high water elevation of Lakes Mead and Mohave.

If you are unsure if your proposed action would occur within wilderness boundaries, contact the Wilderness Coordinator.

Suitable and potential wilderness also exists within the recreation area. Lands designated as suitable or potential wilderness additions shall be managed by the Secretary insofar as practicable as wilderness until such time as said lands are designated as wilderness and will require the minimum requirement analysis.

If the proposed action will take place in designated, suitable, or potential wilderness, proceed to step 2.

If the proposed action or program will not take place in wilderness, suitable, or potential wilderness, proceed with the Compliance review process.

*Step 2*

**Determine whether the proposed action or program is required for the administration of the Wilderness**

DO-41 states: “In order to allow a prohibited activity, the activity must be necessary to manage the area as wilderness.”

The action must also comply with all other applicable laws and policies

If the action is not required for the administration of the area, it is not allowed.

If the action is required for the administration of the area, document what wilderness management objective (see DO-41) is being met and why this action is essential to meet that objective. Proceed to step 3.

### *Step 3*

*Determine if the objectives of the proposed action can be met with actions outside of wilderness.*

Consider:

- Can the objective be met outside of wilderness?
- Will increased educational efforts help attain the objective?
- Will a reduction in visitor use (through disincentives, quota reductions, or closures) eliminate or reduce the need for the action? If so, will that reduction be an acceptable impact to the visitor experience?

*If the objectives of the proposed action can be met with actions outside of, proceed with compliance process and conduct action outside of wilderness.*

If the objectives of the proposed action cannot be met outside of wilderness, document the reasons and proceed to step 4.

### *Step 4*

Develop a list of alternatives to meet the objective of the proposed action. Include ways to reduce or mitigate the impacts of each alternative.

Alternatives should be detailed and specific and include a no-action alternative.

Proposed actions that use motorized equipment or mechanized transport should include, at least the following alternatives: 1) no-action, 2) action using only non-motorized equipment and non-mechanized transport, 3) action using motorized equipment and mechanized transport, and 4) some mixture of 1, 2, and 3. Or, provide justifications to rule out the alternatives.

Again, the preservation of wilderness resources and character will be given significantly more weight than economic efficiency and convenience.

If a compromise of wilderness character is unavoidable, only those actions that preserve wilderness character and/or have localized short-term adverse impacts will be accepted.

Proposed actions that do not use motorized equipment or mechanized transport should still include a range of alternatives that include varying degrees of administrative intrusion on wilderness character.



Consider ways to reduce or mitigate the impacts of each alternative:

- Can the action be timed to minimize impacts to the visitor experience or ecological health?
- Do your alternatives include all available options, tools and techniques?
- Can increased education help mitigate the impacts of the action?
- Can reduced use mitigate the impacts of the action?

List each alternative along with any applicable mitigation measures.

### *Step 5*

Determine the effects of each alternative on wilderness health and character. Include cumulative effects.

Consider:

#### 1. Biophysical effects

- Describe any effects this action will have on the ecological health of the area, including air and water quality, vegetation, wildlife, introduction of exotic species, erosion, siltation, wetlands, and rare, threatened, endangered, or sensitive species. Include both biological and physical effects. Consult subject matter experts as needed.
- In potential wilderness additions, describe whether this action will make restoration to a wilderness condition more difficult when the area is designated as wilderness.

#### 2. Experiential effects

- Describe any effects this action will have on the experience of wilderness visitors. Consider the effects on the opportunity for solitude, natural quiet, self-reliance, surprise, and discovery.
- Describe any effect this action will have on the natural appearance of the area.

#### 3. Effects on wilderness character

- Describe any interference with natural processes, constraints on the freedom of wildlife or visitors, increase of management presence, or other reduction of wildness that this action may cause.

Proceed to step 6 before documenting these effects.

### *Step 6*

#### **Determine the management concerns of each alternative.**

Consider:

1. Health and safety concerns
  - Describe any health and safety concerns associated with this action. Include health and safety considerations of both employees and the public.
2. Societal/political/economic effects
  - Describe any political considerations such as MOUs, agency agreements, etc. that may be affected by this action.
  - Estimate the economic costs of this action.

Describe the effects of each alternative as determined in steps 5 and 6. Quantify these effects when possible, and describe whether the effects are short- or long-term, adverse or beneficial, and localized or far-reaching.

### *Step 7*

#### *Choose a preferred alternative*

NPS management policies states:

“Potential disruption of wilderness character and resources and applicable safety concerns will be considered before, and given significantly more weight than, economic efficiency. If some compromise of wilderness resources or character is unavoidable, only those actions that have localized, short-term adverse impacts will be acceptable.”

Using the information developed in steps 5 and 6, and using the law and policy guidelines presented in this document, choose a preferred action and carefully justify in writing your reasons for choosing this alternative. Submit this document to the Wilderness Coordinator when completed.

### *Step 8*

#### **Proceed with appropriate NEPA compliance pathway.**

Coordinate with Environmental Compliance Specialist.

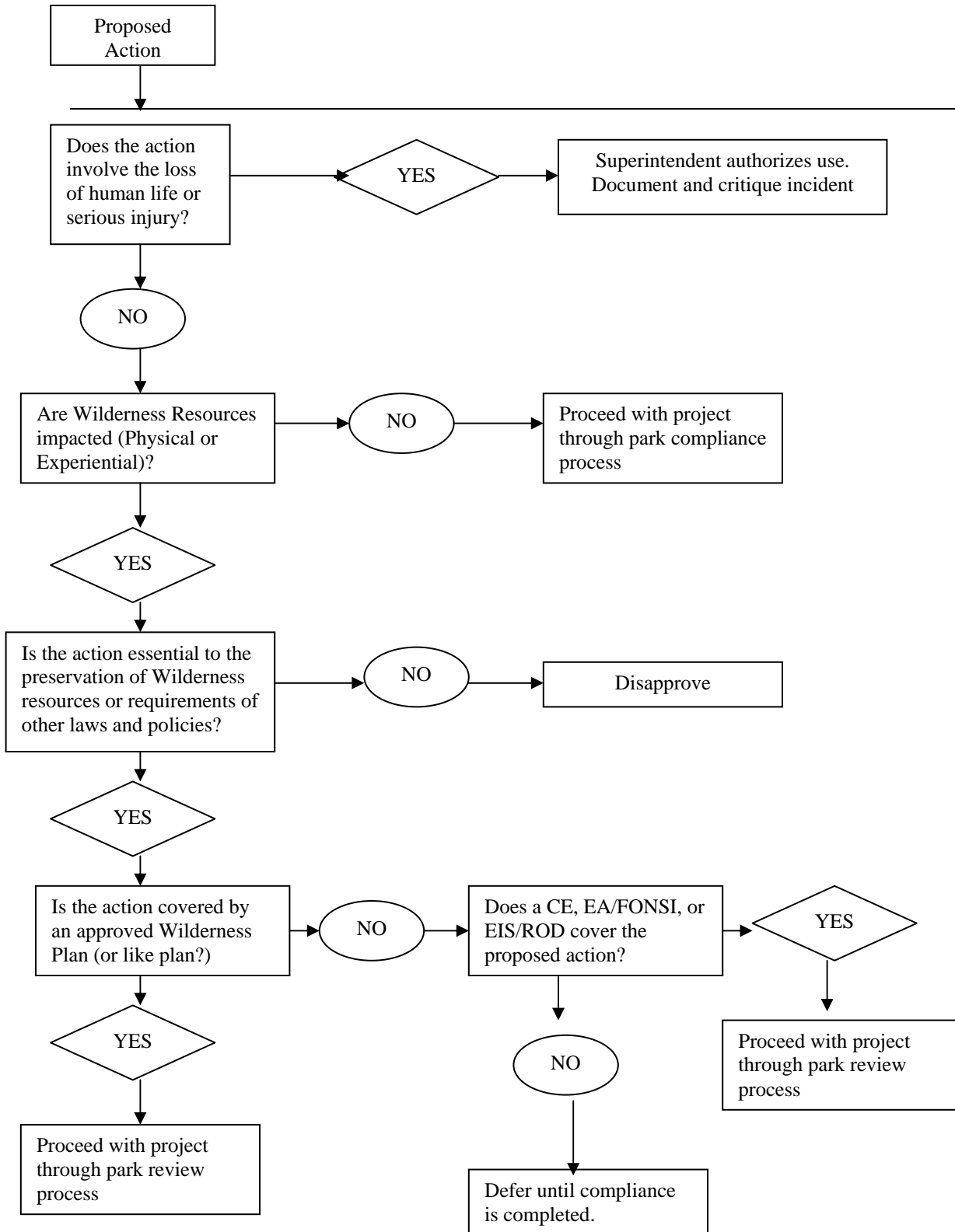
### *Step 9*

#### *Notification and Superintendent Sign-Off*

Following park staff reviews and appropriate environmental compliance, including public and agency notification:

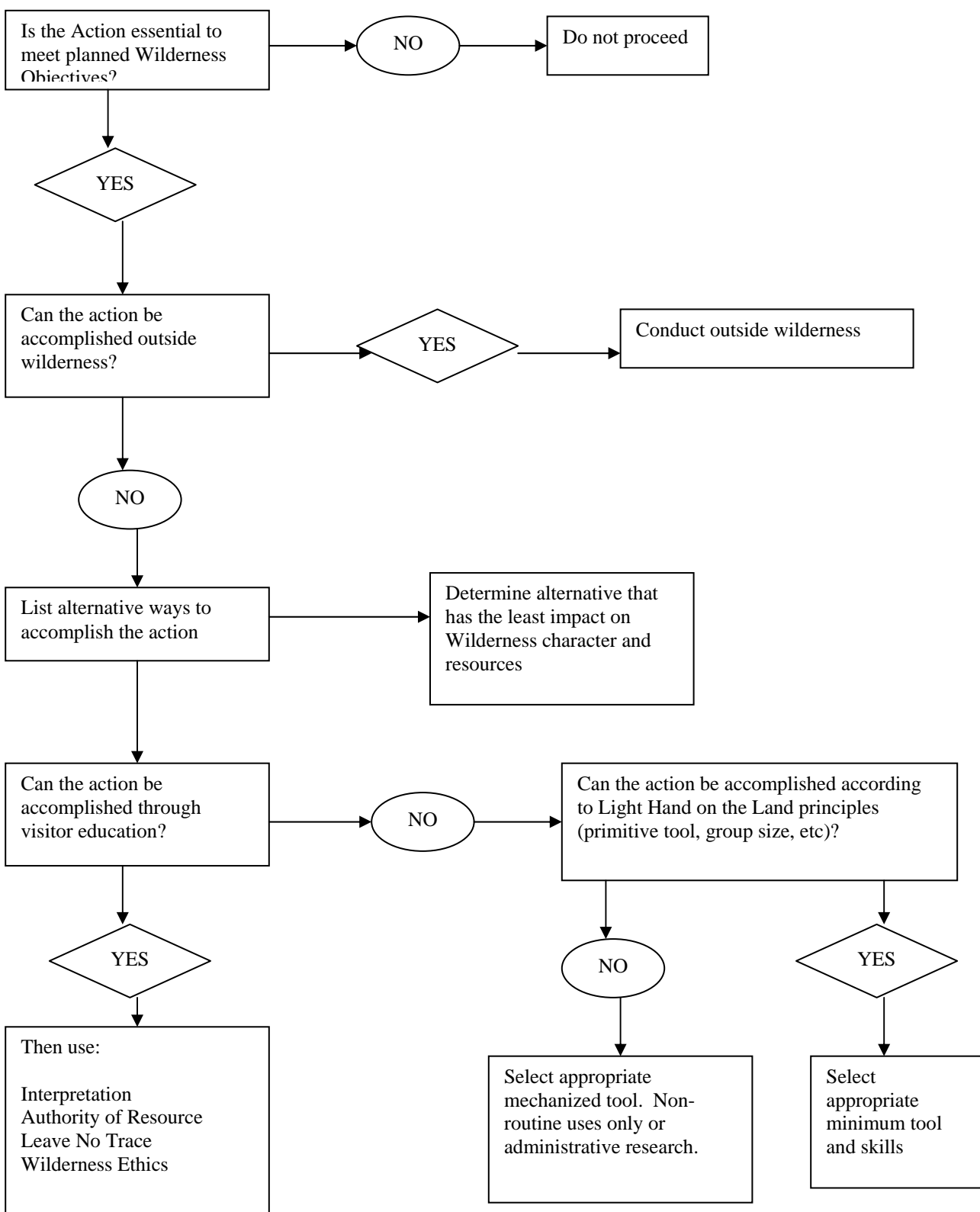
- Complete the Wilderness Project Review and Approval Form.
- Complete the Proposed Action Summary Notice for an Action Within a Wilderness Area and provide to interested (commenting) parties and adjacent land management agencies (i.e. Jointly Managed Wilderness Units).
- Include these forms and the record of public notification in the compliance administrative record.

FLOW CHARTS AND SCREENING QUESTIONS  
MINIMUM TOOL REQUIREMENT ANALYSIS  
PART 1



MINIMUM TOOL REQUIREMENT ANALYSIS  
PART 2

---



---

**Minimum Requirement Analysis**  
**PART 3**  
**Decision Screening Questions**

---

These questions can help you evaluate your proposed action and complete the minimum requirement analysis.

1. Does your action insure that wilderness is not occupied and modified?
2. Does your action maintain or move the Wilderness toward less human influence within legal constraints?
3. Does your rationale allow Wilderness to retain solitude and elements of surprise and discovery?
4. Did you evaluate the traps of making decisions based on economy, convenience, comfort, or commercial value?
5. Did you look beyond the short-term outputs to ensure that future generations will be able to use and enjoy the benefits of an enduring resource of Wilderness?
6. Does the alternative support the Wilderness resource in its entirety rather than maximizing an individual resource?
7. Do you recognize the unique characteristics for this particular Wilderness?
8. Does the action prevent the effects of human activities from dominating natural conditions and processes?

---

FORMS FOR WILDERNESS GUIDELINES

---

PROPOSED ACTION SUMMARY NOTICE  
ACTION WITHIN A WILDERNESS AREA  
LAKE MEAD NATIONAL RECREATION AREA

---

Notice Date:

Proposed Action Date:

Wilderness Name:

State:

Designated Suitable Potential (circle one)

Notification Period Begins:

Notification Period Ends:

Location within Wilderness:

Summary of Proposed Action:

**PROJECT REVIEW AND APPROVAL FORM  
FOR ACTIVITIES IN WILDERNESS**

Proposed Action

---

Location/Wilderness Unit

---

Project Proponent

---

Check one:

- ☐ The proposed action is a temporary, one-time activity.
- ☐ The proposed action will be an on-going, long-term activity.

Reviewed By:

/s/

---

Wilderness Coordinator

Date

Approved By:

/s/

---

Superintendent

Date





**National Park Service  
U.S. Department of the Interior**

**Lake Mead National  
Recreation Area**

**601 Nevada Way  
Boulder City, NV 89005**

**702.293.8947 phone  
702.293.8936 fax**

---

## **Lake Mead National Recreation Area News Release**

**For Immediate Release: September 24, 2004**

**Release #: 68-04**

**Roxanne Dey - 702.293.8947**

### **Environmental Assessment Being Prepared for Aerial Operations At Lake Mead National Recreation Area**

Officials at Lake Mead National Recreation Area are soliciting public comments on proposed aerial operations planned for next year. Some of the operations would take place over designated and proposed wilderness areas within the park. In accordance with National Park Service policies, the use of aerial operations in wilderness must be evaluated, and a minimum requirement analysis completed, to determine what actions are appropriate.

The environmental assessment would be used to analyze the impacts to wilderness resources, and establish mitigation to avoid or minimize any possible impacts. The National Park Service completed a similar document to cover aerial operations for calendar year 2004. The new document will cover activities beginning January 1, 2005 and will serve as an interim management document until a wilderness management plan for Lake Mead National Recreation Area is completed.

Issues that will be addressed in the environmental assessment include routine patrols, maintenance activities, wildlife management, and other resource management activities. The assessment will exclude emergency operations such as fire suppression and/or search and rescue activities. These atypical operations would be conducted in accordance with all applicable regulations, policies, and guidelines.

The National Park Service is in the process of identifying and evaluating feasible alternatives, including no action, for this environmental assessment. As a result, Lake Mead National Recreation Area is seeking public input on the issues and potential alternatives.

Written comments should be sent by October 25, 2004 to: Superintendent, Lake Mead National Recreation Area, Attention: Compliance Office, 601 Nevada Way, Boulder City, Nevada 89005.